

All Lesman thermocouples and RTDs are made to your exact specifications. If you can design, describe or draw the temperature assembly you need, we can supply it — without the “custom” costs. Need to measure temperatures in hot processes? Take a look at Ametek Land infrared scanners and thermometers.

Lesman can help you find the best temperature transmitter match for your process. Whether you need HART® communications, digital displays, or a simple DIN-rail mounted transmitter — it’s all here!



	Prices Start at	See Page
<b>Infrared Temperature Measurement</b>		
Ametek Land FTI-E Fixed Thermal Imaging System	<b>Call for Prices</b>	127
Ametek Land Landscan LSP Infrared Scanners		126
Ametek Land SoloNet Web-Ready Infrared Thermometers		123
Ametek Land System4 Infrared Temperature Measurement Systems		124

Some products are not available in all Lesman markets or geographic areas. Prices in this catalog are current at the publication date, and are subject to change without notice.

## Resistance Temperature Detectors (RTDs)

Pyromation 3A Sanitary RTDs for the Food Industry	\$117.00	117
Pyromation RTDs for General Service	\$72.35	115
Pyromation RTDs with Threaded Thermowells	\$116.00	116
United Electric Heat Trace RTDs with Replaceable Sensors	\$115.00	114
United Electric Sensor Box Temperature Assembly Kit	\$695.00	114

## Temperature Transmitters

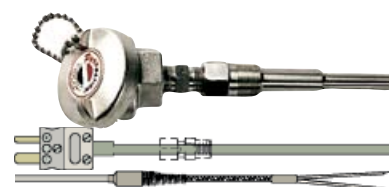
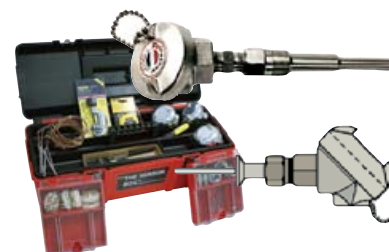
Honeywell STT170 Programmable Temperature Transmitters	\$115.00	129
Honeywell STT250 Smart Temperature Transmitter	\$480.00	130
Honeywell STT350 Smart Temperature Transmitter with Digital Display	\$892.00	131
Pyragon TouchTemp II Programmable Temperature Transmitter	\$395.00	135
Pyromation Transmitter Assemblies for Field-Mount RTDs	\$100.00	116
Pyromation Mini Transmitter Assemblies for Small Spaces	\$105.00	117
Siemens SITRANS T Head Mount Temperature Transmitters	\$105.00	132
Siemens SITRANS TF Field Mount Temperature Transmitters	\$423.00	134

## Thermocouples

Pyromation Industrial Thermocouples with Termination Heads	\$61.80	119
Pyromation Metal Protection Tube Thermocouple Assemblies	\$66.40	121
Pyromation Thermocouple Assemblies for General Service	\$31.60	118
Pyromation Thermocouple Assemblies with Quick-Disconnect Plugs	\$18.40	119
Pyromation Thermocouples with Matching Thermowells	\$66.40	120
United Electric Sensor Box Temperature Assembly Kit	\$695.00	114

## Parts and Accessories

DIN-Rail Mountable DC Power Supplies	\$60.00	136
Meriam MFC4150 HART® Handheld Communicator	\$3302.00	136
Pyromation Plugs and Jacks	\$4.70	122
Pyromation Thermocouple Accessories	Call	121
Pyromation Thermocouple Wire and Sensor Extension Wire	Call	122



# Temperature Assemblies

## Build Your Own Temperature Assemblies with the UE Sensor Box


**UE**

Have your plant back up in minutes, not days! United Electric's Sensor Box is designed for maintenance and instrument technicians, in any plant where temperature sensors are an important part of the operation — and downtime is not an option.

**Looking for wells? Don't see the part you need? Call Lesman.**

### Ordering Instructions

The basic Sensor Box™ includes toolbox, tools, parts, and any combination of up to six sensors. Ordering Example: EK1000 with (3) RT1260, (2) MI1113JG and (1) MI1113KG sensor pods.

### Model Selection Guide

Description	Catalog Number	Price Each
Basic UE Sensor Box™, complete with toolbox, tools, and parts listed below.	EK1000	\$695.00
<b>Sensor Parts in Toolbox</b> Housing, 0.250" OD x 24" long, 316 stainless steel NEMA 4 Aluminum terminal head, 4-post ceramic block Spring-loading kit for AC1054 head Nipple, 1/2" NPT x 2" long, carbon steel Union, 1/2" NPT, carbon steel for NEMA 4 applications Wire guide (Bag of 10) Crimper, tube cutter, screwdriver, tape measure, wire stripper	(6) HS2524 (3) AC1054 (6) AC1087 (6) NC1002 (3) UC1011 (1) TS1092 (1 ea.) Tools	
<b>Sensors* (6 Total, Mix and match as needed.)</b> Pt100Ω RTD, 3-wire, Teflon insulation, max. temp. 400°F Pt100Ω RTD, 3-wire, fiberglass insulation, max. temp. 900°F Thermocouple with ungrounded junction, fiberglass leads. Thermocouple with grounded junction, fiberglass leads. Thermocouple with ungrounded junction, Teflon leads. Thermocouple with grounded junction, Teflon leads.	RT1260 RT1254 MI1113_U* MI1113_G* MI1113TF_U* MI1113TF_G*	
<b>Optional Components</b>	316 stainless steel housing, 0.250" OD x 12" long	HS2512 \$ 7.00
	2" long carbon steel nipple, 1/2" NPT	NC1002 2.00
	2" long stainless steel nipple, 1/2" NPT	NS1002 6.00
	1/2" NPT union, carbon steel, for NEMA 4	UC1011 17.00
	1/2" NPT union, stainless steel, for NEMA 4	HF1091 33.00
	Plastic wire bushing (pack of 10)	TS1092 33.00

\* Specify calibration J, K, T, or E (e.g., MI1113KU). Dual calibration pods are available at a slightly higher cost. Please indicate as -KK, -EE, -JJ or -TT. Pods with fiberglass leads are rated to 900°F; those with Teflon leads are rated to 400°F. For higher temperatures, Call Lesman.

## Heat Trace RTDs with Replaceable Elements

### Features

- Replaceable RTD element
- Heat transfer pad conforms to pipe radius for fastest temperature response
- Rugged stainless steel sheath provides excellent mechanical protection
- 100Ω RTDS with ranges from 0° to 1400°F, depending on the construction
- Designed for NEMA 4, 4X, and Class I, Div 1



### Model Selection Guide

Description	Catalog Number	Price Each
Heat Trace RTD with Replaceable Element		
NEMA 4 Cast Aluminum Head	T1804- _	\$115.00
Explosion-Prf Cast Aluminum Head	T1804X- _	160.00
Nominal Pipe Size/ O.D.	Flat 0"	F 0.00
	0.50" 0.84"	5 0.00
	0.75" 1.05"	7 0.00
	1.00" 1.32"	10 0.00
	1.50" 1.90"	15 0.00
	2.00" 2.38"	20 0.00
	3.00" 3.50"	30 0.00
	4.00" 4.50"	40 0.00
	6.00" 6.63"	60 0.00
	8.00" 8.63"	80 0.00
Replacement Element for T1804	T1805	30.00
Replacement Element for T1804X	T2588	32.00

UE's unique heat trace RTDs can save you time and money, and increase overall system reliability and up-time. The unit features a terminal head and right-angle shaped outer sheath, with a curved weld-pad at the end. The replaceable RTD element assembly is contained in the outer tube and, when installed, presses against the pipe. Heat transfer is excellent, and heat conduction away from the element is minimal.

If the element ever needs to be replaced, it's a five-minute job to open the terminal head, unwire the sensor, slide it out and slide a new one in. No downtime while you wait for insulation handlers, welders, and technicians to fit you into their schedules.

**We have all kinds of devices to take the signals from your temperature sensors!**



**Recorders**  
See page 85



**Controllers**  
See page 35



**Panel Meters**  
See page 69



**Temperature Transmitters**  
See page 128

# RTDs Resistance Temperature Detectors for General Service

## Features

- Available in any length
- 316 stainless steel sheath
- 3-wire DIN standard 0.00385Ω temperature coefficient
- 2 accuracies: ±0.1% and ±0.01%
- For temperatures from -328° to 400°F
- Transition fitting with spring relief good to over 400°F
- Works with compression fittings

## 100Ω RTD Assemblies with Leads

For use in any application where you need an RTD! Assembly comes complete with 36" Teflon-coated leadwires and a transition fitting with spring relief that's good to 350°F. If you need a different sheath material or a dual element, just call, we can make just about anything you can describe!

## 100Ω RTD Assemblies with Quick-Disconnect Plugs

Great for those applications where you need to disconnect the RTD from the leadwires. You can also attach any length leadwire you want, just by ordering your desired length of RTD extension wire (*see thermocouple extension wire section*). Assembly comes complete with standard sized plug and jack. Need a dual element of different sheath material? Give us a call. We can get nearly anything you can describe.

## 100Ω RTD Assemblies with Termination Heads

When you need a serious temperature sensor, rely on the Lesman RTD. With its polypropylene termination head, you can quickly and easily connect conduit and wiring. Need a dual element of different sheath material? Call us. Our factory-trained staff will find the RTD that best meets your process measurement needs.

**Custom assemblies ready in as few as 48 hours! Call Lesman for details.**

## Model Selection Guide — Assemblies with Leads

Sheath		Accuracy	Catalog Number for 12" Sheath Length	Price Each	Price Adder per 6" Sheath Length
Material	Diameter				
100Ω RTD Assemblies with 36" Leads					
316 SS	1/8"	±0.1%	R1T185L283-012-00-15-T3036-2	\$72.35	\$7.00
316 SS	3/16"	±0.1%	R1T185L383-012-00-15-T3036-2	72.35	7.00
316 SS	1/4"	±0.1%	R1T185L483-012-00-15-T3036-2	72.35	7.00
316 SS	3/8"	±0.1%	R1T185L683-012-00-15-T3036-2	72.35	7.00
316 SS	1/8"	±0.01%	R5T185L283-012-00-15-T3036-2	102.35	7.00
316 SS	3/16"	±0.01%	R5T185L383-012-00-15-T3036-2	102.35	7.00
316 SS	1/4"	±0.01%	R5T185L483-012-00-15-T3036-2	102.35	7.00
316 SS	3/8"	±0.01%	R5T185L683-012-00-15-T3036-2	102.35	7.00

## Model Selection Guide — Assemblies with Quick-Disconnect Plugs

Sheath		Accuracy	Catalog Number for 12" Sheath Length	Price Each	Price Adder per 6" Sheath Length
Material	Diameter				
100Ω RTD Assemblies with Quick-Disconnect Plugs					
316 SS	1/8"	±0.1%	R1T185L283-012-00-4MC	\$87.50	\$7.00
316 SS	3/16"	±0.1%	R1T185L383-012-00-4MC	87.50	7.00
316 SS	1/4"	±0.1%	R1T185L483-012-00-4MC	87.50	7.00
316 SS	3/8"	±0.1%	R1T185L683-012-00-4MC	87.50	7.00
316 SS	1/8"	±0.01%	R5T185L283-012-00-4MC	117.50	7.00
316 SS	3/16"	±0.01%	R5T185L383-012-00-4MC	117.50	7.00
316 SS	1/4"	±0.01%	R5T185L483-012-00-4MC	117.50	7.00
316 SS	3/8"	±0.01%	R5T185L683-012-00-4MC	117.50	7.00

## Model Selection Guide — Assemblies with Termination Heads

Sheath		Accuracy	Catalog Number for 12" Sheath Length	Price Each	Price Adder per 6" Sheath Length
Material	Diameter				
100Ω RTD Assemblies with Aluminum Termination Heads (See Below for Optional Heads)					
316 SS	1/8"	±0.1%	R1T185L283-012-00-8HN31	\$113.00	\$7.00
316 SS	3/16"	±0.1%	R1T185L383-012-00-8HN31	113.00	7.00
316 SS	1/4"	±0.1%	R1T185L483-012-00-8HN31	113.00	7.00
316 SS	3/8"	±0.1%	R1T185L683-012-00-8HN31	113.00	7.00
316 SS	1/8"	±0.01%	R5T185L283-012-00-8HN31	143.00	7.00
316 SS	3/16"	±0.01%	R5T185L383-012-00-8HN31	143.00	7.00
316 SS	1/4"	±0.01%	R5T185L483-012-00-8HN31	143.00	7.00
316 SS	3/8"	±0.01%	R5T185L683-012-00-8HN31	143.00	7.00

**For All Assemblies:** To select a longer or shorter element length, just insert (in inches) the length you want in place of the 12 in digits 10 and 11 of the catalog number (*above R5T185L38123...*) Add \$7.00 for each additional 6" length (or part of 6") over 12".

**For Assemblies with Leads:** For a longer lead length, just insert your desired length (in inches) in place of the 036 near the end of the catalog number. Price of the additional lead length is \$1.00 per foot.

## Optional Termination Head Materials Available!

For Optional Head...	Replace 8HN31 with	Add or Deduct
Aluminum Screw Cover, 1/2" Carbon Steel Hex Fitting	6HN31	\$-8.00
Polypropylene Screw Cover, 1/2" SS Hex Fitting	8HN63	-3.00
Cast Iron Screw Cover, 1/2" SS Hex Fitting	8HN34	6.00
Class B Explosion-Proof Head, 1/2" SS Hex Fitting	8HN72	56.00
Stainless Steel Head, 1/2" SS Hex Fitting	8HN91	95.00

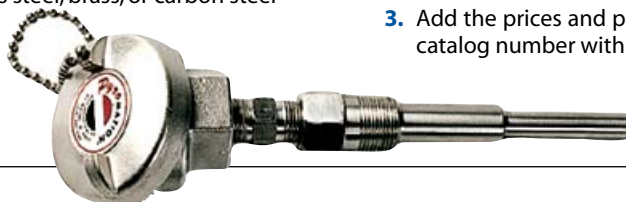




## RTDs with Threaded Thermowells

### Features

- 3-wire DIN standard 0.00385Ω temperature coefficient
- For temperatures from -328° to 400°F
- Well materials in 304 or 316 stainless steel, brass, or carbon steel
- 1/4" OD, 316 stainless steel sheath
- Aluminum screw cover head
- Accuracy: ±0.1%



We made it easy for you to select RTDs with threaded thermowells. It's as easy as 1,2,3!

1. Pick a process thread connection, well length, and material.
2. Add the catalog number for the matching RTD.
3. Add the prices and part numbers together to get your complete catalog number with pricing!

### Model Selection Guide

Well Selection						Material and Price*					RTD Selection	
Process Thread	Stem Length "A"	Insertion Length "U"	Well Diam. "D"	Shank Diam. "Q"	Catalog Number	Brass "B"	Steel "S"	304 SS "304"	316 SS "316"		Catalog Number	Price Each
1/2"	2-1/2"	1-1/8"	1/2"	1/2"	49-*	\$21.45	\$13.86	\$21.45	\$26.73		R1T185L483-02.5-SL-8HN31	\$116.00
1/2"	4"	2-1/2"	1/2"	1/2"	99-*	23.10	16.83	23.10	28.38		R1T185L483-004-SL-8HN31	116.00
1/2"	6"	4-1/2"	1/2"	5/8"	185-U4 1/2 -*	29.37	21.12	29.37	35.97		R1T185L483-006-SL-8HN31	116.00
1/2"	9"	7-1/2"	1/2"	5/8"	185-U7 1/2 -*	44.59	35.71	44.59	59.99		R1T185L483-009-SL-8HN31	116.00
1/2"	12"	10-1/2"	1/2"	5/8"	185-U10 1/2 -*	54.57	46.15	54.57	73.37		R1T185L483-012-SL-8HN31	116.00
1/2"	15"	13-1/2"	1/2"	5/8"	185-U13 1/2 -*	69.63	58.21	69.63	94.45		R1T185L483-015-SL-8HN31	123.00
1/2"	18"	16-1/2"	1/2"	5/8"	185-U16 1/2 -*	84.69	70.27	84.69	115.52		R1T185L483-018-SL-8HN31	130.00
1/2"	24"	22-1/2"	1/2"	5/8"	185-U22 1/2 -*	114.82	94.40	114.82	157.69		R1T185L483-024-SL-8HN31	137.00
3/4"	2-1/2"	1-5/8"	1/2"	1/2"	50-*	21.45	13.86	21.45	26.73		R1T185L483-02.5-SL-8HN31	116.00
3/4"	4"	2-1/2"	1/2"	1/2"	100-*	23.10	16.83	23.10	28.38		R1T185L483-004-SL-8HN31	116.00
3/4"	6"	4-1/2"	1/2"	3/4"	200-U4 1/2 -*	29.37	21.12	29.37	35.97		R1T185L483-006-SL-8HN31	116.00
3/4"	9"	7-1/2"	1/2"	3/4"	200-U7 1/2 -*	44.59	35.64	44.59	59.99		R1T185L483-009-SL-8HN31	116.00
3/4"	12"	10-1/2"	1/2"	3/4"	200-U10 1/2 -*	54.57	46.15	54.57	73.37		R1T185L483-012-SL-8HN31	116.00
3/4"	15"	13-1/2"	1/2"	3/4"	200-U13 1/2 -*	69.63	58.21	69.63	94.45		R1T185L483-015-SL-8HN31	123.00
3/4"	18"	16-1/2"	1/2"	3/4"	200-U16 1/2 -*	84.69	70.27	84.69	115.52		R1T185L483-018-SL-8HN31	130.00
3/4"	24"	22-1/2"	1/2"	3/4"	200-U22 1/2 -*	114.82	94.40	114.82	157.69		R1T185L483-024-SL-8HN31	137.00
1"	2-1/2"	1-5/8"	1/2"	1/2"	51-*	25.74	19.47	25.74	32.01		R1T185L483-02.5-SL-8HN31	116.00
1"	4"	2-1/2"	1/2"	1/2"	101-*	31.35	24.75	31.35	36.96		R1T185L483-004-SL-8HN31	116.00
1"	6"	4-1/2"	1/2"	7/8"	201-U4 1/2 -*	42.24	29.04	42.24	48.51		R1T185L483-006-SL-8HN31	116.00
1"	9"	7-1/2"	1/2"	7/8"	201-U7 1/2 -*	54.57	46.15	54.57	73.37		R1T185L483-009-SL-8HN31	116.00
1"	12"	10-1/2"	1/2"	7/8"	201-U10 1/2 -*	67.53	52.16	67.53	90.77		R1T185L483-012-SL-8HN31	116.00
1"	15"	13-1/2"	1/2"	7/8"	201-U13 1/2 -*	87.13	67.23	87.13	111.86		R1T185L483-015-SL-8HN31	123.00
1"	18"	16-1/2"	1/2"	7/8"	201-U16 1/2 -*	106.73	82.29	106.73	142.64		R1T185L483-018-SL-8HN31	130.00
1"	24"	22-1/2"	1/2"	7/8"	201-U22 1/2 -*	145.94	112.41	145.94	194.50		R1T185L483-024-SL-8HN31	137.00

\*Replace the asterisk with the letter or number in quotes under material (i.e., B=Brass, S=Steel, 304=304SS, etc.)

### Optional Termination Head Materials Available!

For Optional Head...	Replace 8HN31 with	Add or Deduct
Polypropylene Screw Cover, 1/2" SS Hex Fitting	8HN63	\$-3.00
Cast Iron Screw Cover, 1/2" SS Hex Fitting	8HN34	6.00
Explosion-Proof Screw Cover, 1/2" SS Hex Fitting	8HN71	22.00
316L Stainless Steel Head, 1/2" SS Hex Fitting	8HN91	95.00

**Don't see the configuration you need?**

Fill out the Custom Thermocouple Datasheet, available online at [www.Lesman.com/datasheets](http://www.Lesman.com/datasheets)

If you can describe it, draw it, or design it, we can probably build it for you. Best yet, all Lesman custom thermocouples and RTDs come to you without any custom costs.

## Order a Complete Field-Mount RTD and Transmitter Assembly

Add the following complete part number to the RTD and thermowell assembly above. A complete transmitter part number looks like this: ,T-440-385U-S(50-300)F. In Stock at Lesman: 440-385U-S(0-200)F

### Adding Head-Mounted Transmitter

Description	Catalog Number	Price
440 Programmable Temperature Transmitter 3-Wire Pt100Ω RTD (alpha = 0.00385)	,T-440-	\$100.00
Fault	Upscale Burnout (20.5 mA)	385U- 0.00
Signal	Downscale Burnout (3.8 mA)	385D- 0.00
Range	Lower Limit – Upper Limit (Numeric)	S(_____-_____-) 0.00
Scale	Celsius	C 0.00
	Fahrenheit	F 0.00



### Specifications

**Output:** 4-20 mA signal

**Current:** ≤ 3.5 mA input required; ≤ 23 mA limit

**Power Supply:** 10 to 35 VDC polarity protected

**Ambient Temperature:** -40° to 185°F

**Construction:** Polycarbonate housing, polyurethane potting

**Ingress Protection:** IP00/IP54 installed in sensor head

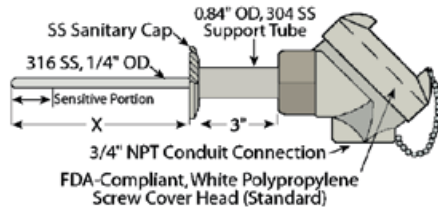
**Vibration Protection:** 4g (2-150Hz) per IEC 60 068-2-6

**EMC Immunity:** Interference immunity and emission per EN 61 326-1



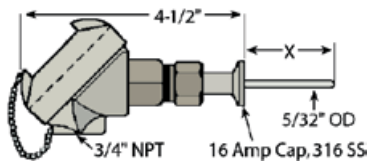
# 3 RTDs for the Food Industry

All RTDs are DIN standard with a temperature coefficient of 0.00385. Temperature limit is 400°F max..



## Clean-In-Place (CIP) RTDs

(Above) All our CIP RTDs exceed the 3A Sanitary Council Standard #09-08, making them perfect for use in dairy and food processing. They are available in  $\pm 0.1\%$  or  $\pm 0.01\%$  accuracies. The polypropylene head is ideal for washdown areas. Please allow 5-7 days for delivery.



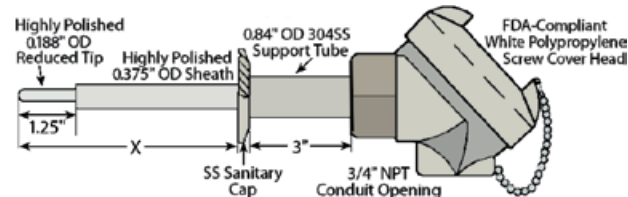
## Mini Sanitary CIP RTDs

(Above) These miniature sanitary CIP RTDs come with a 16 Amp Triclover cap to fit 1/2" and 3/4" tube size sanitary fittings, and meet 3A Sanitary Council Standard #09-08. Please allow 3 weeks for delivery. Express delivery (3-5 days) is available. Call for details.

## Fast Response RTDs for HTST Applications

(At Right) When an RTD is used in a HTST (High Temperature Short Time) application, the FDA requires it to respond in less than 4 seconds. So, our HTST fast response RTD is perfect — it meets 3A and the FDA time requirements. The polypropylene head is great for washdown areas, and includes wire seal security screws. Please allow 5-7 days for delivery.

**Don't see the assembly you need?  
Call Lesman. We'll get you what  
you're looking for!**



## HTST RTDs: 3/8" O.D. Sheath Diameter

Immersion Length	Cap Size and Type	Accuracy	Catalog Number	Price
4"	1-1/2" Triclover 16 AMP	$\pm 0.01\%$	R5T185L68R383-04-HTST-1-5-63-HS	\$189.00
4"	2" Triclover 16 AMP	$\pm 0.01\%$	R5T185L68R383-04-HTST-2-5-63-HS	194.00
5"	1-1/2" Triclover 16 AMP	$\pm 0.01\%$	R5T185L68R383-05-HTST-1-5-63-HS	189.00
5"	2" Triclover 16 AMP	$\pm 0.01\%$	R5T185L68R383-05-HTST-2-5-63-HS	194.00

## Mini Temperature Transmitters for Small Spaces!

These miniature RTD transmitters are ideal for monitoring temperature in tanks and pipes. The water-tight construction meets the NEMA 6/IP68 protection ratings. The unit includes an M12 process connection housing and a two-wire transmitter with analog output. Transmitters can be ranged from -60° to 320°F, and accept Pt100Ω inputs. Transmitters on 3A Sanitary RTDs will have the 3A Sanitary approval and a 316 stainless steel Clean-In-Place connection.

To add a transmitter to your RTD assembly, finish the assembly part number with the following: ,T-450-f-S(range)e, where f= the fault signal: U for upscale, D for downscale, e= engineering units: C for Celsius, F for Fahrenheit.

Example: ,T-450-U-S(0-200)F. Add \$105.00 to the assembly total price.



**Order this mini transmitter by adding the following to your RTD assembly catalog number.**

,T-450-[U/D]-S(range)[C/F] ..... **Price Adder: \$105.00**

# General Purpose Thermocouple Assemblies with Leads

## Features

- Available in any length
- Inconel or 316 stainless steel sheath
- Transition fitting with spring relief good to 1000°F \*
- Use with compression fittings
- Bend to any configuration you need
- 36" 24-gauge Teflon leadwire standard

Need a different sheath material or a dual element? Call Lesman! We can make almost anything you can describe. Remember: when wiring thermocouples, red is always negative.

## Temperature Range Selection

Thermocouple Type	Suggested Range
J	32° to 1400°F
K	32° to 2300°F
E	32° to 1600°F
T	-300° to 700°F

Do not use 316 SS above 1700°F. (Max temp varies by sheath diameter.)

\* Transition Fittings Note: For use at temperatures above 500° F, please specify fiberglass wire: 11\_ \_ \_ for temps to 900°F, 21\_ \_ \_ for temps to 1300°F (Types J, K only).

**Need compression fittings, plugs, or other accessories? Call Lesman.**

## Model Selection Guide

Sheath		12" Sheath Length Catalog Number	Price Each*		Price Adder per +6" Length
Material	Diam.		Grounded/ Exposed	Un- grounded	
Type J (Iron Constantan) Thermocouple					
316 SS	1/16"	J18(*)-012-00-15HT-T1036-2	31.60	34.60	0.90
316 SS	1/8"	J28(*)-012-00-15HT-T1036-2	28.50	31.50	1.40
316 SS	3/16"	J38(*)-012-00-15HT-T1036-2	30.70	33.70	2.30
316 SS	1/4"	J48(*)-012-00-15HT-T1036-2	35.10	38.10	3.70
Type K (Chromel-Alumel) Thermocouple					
Inconel	1/8"	K23(*)-012-00-15HT-T1036-2	31.30	34.30	2.60
Inconel	3/16"	K33(*)-012-00-15HT-T1036-2	35.40	38.40	4.30
Inconel	1/4"	K43(*)-012-00-15HT-T1036-2	42.50	45.50	6.70
316 SS	1/8"	K28(*)-012-00-15HT-T1036-2	28.50	31.50	1.40
316 SS	3/16"	K38(*)-012-00-15HT-T1036-2	30.70	33.70	2.30
316 SS	1/4"	K48(*)-012-00-15HT-T1036-2	35.10	38.10	3.70
Type E (Chromel-Constantan) Thermocouple					
316 SS	1/16"	E18(*)-012-00-15HT-T1036-2	33.90	36.90	1.50
316 SS	1/8"	E28(*)-012-00-15HT-T1036-2	29.90	32.90	1.60
316 SS	3/16"	E38(*)-012-00-15HT-T1036-2	32.50	35.50	2.50
316 SS	1/4"	E48(*)-012-00-15HT-T1036-2	36.10	39.10	4.40
Type T (Copper-Constantan) Thermocouple					
316 SS	1/16"	T18(*)-012-00-15HT-T1036-2	33.90	36.90	1.30
316 SS	1/8"	T28(*)-012-00-15HT-T1036-2	29.40	32.40	1.80
316 SS	3/16"	T38(*)-012-00-15HT-T1036-2	32.50	35.50	2.50
316 SS	1/4"	T48(*)-012-00-15HT-T1036-2	37.60	40.60	4.30

\*Please specify junction type: G=Grounded, E=Exposed, U=Ungrounded. Insert the correct letter designation in place of the (\*) for a complete catalog number.

To select a longer or shorter custom sheath length, insert the desired length (in inches) in the three digits before the (\*) (012=12" as shown above). For lengths over 12", be sure to include the appropriate price adder per 6" additional length. There is no price reduction for lengths under 12". For longer lead lengths, insert the desired length (in inches) in the three digits near the end of the catalog number (036=36" as shown above). For each additional 12" length, add \$1.00 to the price.

**Thermocouples don't last forever.** In most industrial applications, they fail at a predictable interval, one that's affected by temperature, exposure to corrosive gases or liquids, and environmental conditions.

## Routine Thermocouple Replacement

With today's focus on quality assurance, calibration, and ISO compliance, there's a high emphasis in making sure your process is running at the right temperature. Talk to your Lesman sales consultant about implementing a replacement and calibration program to meet ISO compliance standards, reduce downtime, increase process quality, and decrease the risk and frequency of accidents.

We can help inventory your thermocouple applications, and make recommendations for creating a replacement program that fits. If you

## Recommended Thermocouple Replacement Schedule

Temperature Ranges	T/C Type	Time Frame
400°F and Below	Type J or K	Every 5 Years or More
900° to 1200°F	Type K	Every 1 or 2 Years
1200° to 1800°F	Type K	Every 6 to 12 Months
1800° to 2200°F	Type K	Every 3 Months
1800°F and Above	Types R, S, or B	Only as Needed

need it, your process can be contracted for scheduled replacement of thermocouples and parts — protection tubes, wiring, connector blocks, and head covers — all when the system is cool and safe to work on.

**Need service?** Your Lesman account manager can work with you to set up the program you need.

## Custom Sensors — Without Custom Pricing!

To help make your temperature assembly ordering simple, we've listed the most popular models on these pages. But if what you need isn't here, you can still get it, **without paying a premium charge for special orders.**

There's no need to worry about incompatibility or custom orders. All Lesman thermocouples and RTD assemblies are made exactly to your specifications. And, since we start from scratch with your design, you

don't have to worry about any add-on charges for modifications to the manufacturer's product.

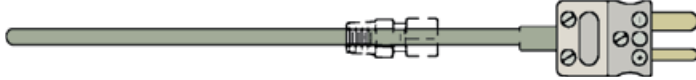
If you can design, describe, or draw the temperature assembly you need, we can supply it. Call and ask for our Thermocouple Datasheet. We'll fax it to you so that you can specify all the parts you need. Then, you can fax or mail it, or call back. We'll quote you a price, and let you know when you can expect delivery. It's that simple!

**Build the custom sensors you need.**  
Configuration datasheet  
available online at  
[www.Lesman.com/datasheets](http://www.Lesman.com/datasheets)



# General Purpose Thermocouples

## Thermocouples with Quick-Disconnect Plugs



### Features

- Available in any length
- Inconel or 316 stainless steel sheath (316 SS good to 1700° F, Inconel good to 2100° F; varies by sheath diameter)
- Plug and jack good to 350° F
- Use with compression fittings
- Bend to any configuration

Great for applications where you need to easily disconnect the thermocouple from the leadwires. You can also attach any length leadwire you want, just by ordering your desired length of thermocouple extension wire.

Need a dual element of different sheath material? Give us a call. We can get just about anything you can describe.

### Model Selection Guide

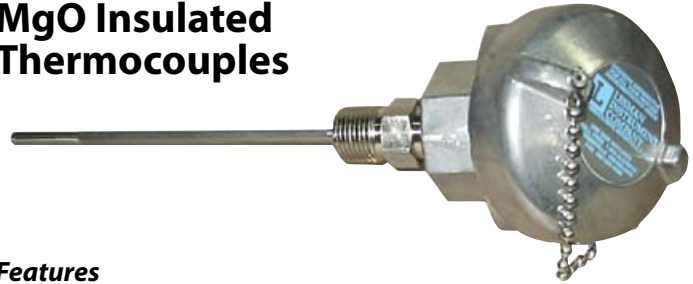
Sheath		12" Length Catalog Number	Price Each*		Price Adder per +6" Length
Material	Diam.		Grounded/ Exposed	Un- grounded	
Type J (Iron Constantan) Thermocouple					
316 SS	1/16"	J18(*)-012-00-04	21.50	24.50	0.90
316 SS	1/8"	J28(*)-012-00-04	18.40	21.40	1.40
316 SS	3/16"	J38(*)-012-00-04	20.60	23.60	2.30
316 SS	1/4"	J48(*)-012-00-04	25.00	28.00	3.70
Type K (Chromel-Alumel) Thermocouple					
Inconel	1/8"	K23(*)-012-00-04	21.20	24.20	2.60
Inconel	3/16"	K33(*)-012-00-04	25.30	28.30	4.30
Inconel	1/4"	K43(*)-012-00-04	32.40	35.40	6.70
316 SS	1/16"	K18(*)-012-00-04	21.50	24.50	0.90
316 SS	1/8"	K28(*)-012-00-04	18.40	21.40	1.40
316 SS	3/16"	K38(*)-012-00-04	20.60	23.60	2.30
316 SS	1/4"	K48(*)-012-00-04	25.00	28.00	3.70
Type E (Chromel-Constantan) Thermocouple					
316 SS	1/16"	E18(*)-012-00-04	23.80	26.80	1.50
316 SS	1/8"	E28(*)-012-00-04	19.80	22.80	1.60
316 SS	3/16"	E38(*)-012-00-04	22.40	25.40	2.50
316 SS	1/4"	E48(*)-012-00-04	26.00	29.00	4.40
Type T (Copper-Constantan) Thermocouple					
316 SS	1/16"	T18(*)-012-00-04	23.80	26.80	1.30
316 SS	1/8"	T28(*)-012-00-04	19.30	22.30	1.80
316 SS	3/16"	T38(*)-012-00-04	22.40	25.40	2.50
316 SS	1/4"	T48(*)-012-00-04	27.50	30.50	4.30

\*Please specify junction type: G=Grounded, E=Exposed, U=Ungrounded. Insert the correct letter designation in place of the (\*) for a complete catalog number.

To select a longer or shorter custom sheath length, insert the desired length (in inches) in the three digits before the (\*) (012=12" as shown above). For lengths over 12", include the appropriate price adder per 6" additional length. There is no price reduction for lengths under 12".

**For details on thermocouple initial material tolerances and thermocouple type color codes, see page 489.**

## MgO Insulated Thermocouples



### Features

- Use with compression fittings
- 1/2" NPT process and conduit connections
- Inconel or 316 stainless steel sheath (Inconel good to 2100° F; Varies by sheath diameter)

If you need a dual element or different sheath material, give us a call. We have most materials available. Please remember that when wiring thermocouples, red is always negative.

### Model Selection Guide

Sheath		12" Length Catalog Number	Price Each*		Price Adder Each +6"
Material	Diam.		Grounded/ Exposed	Un- grounded	
Type J (Iron Constantan) Thermocouple, 32° to 1400°F					
316 SS	1/8"	J28(*)-012-00-8HN31	61.80	64.80	1.40
316 SS	3/16"	J38(*)-012-00-8HN31	64.00	67.00	2.30
316 SS	1/4"	J48(*)-012-00-8HN31	68.40	71.40	3.70
Type K (Chromel-Alumel) Thermocouple, 32° to 2300°F**					
Inconel	1/8"	K23(*)-012-00-8HN31	64.60	67.60	2.60
Inconel	3/16"	K33(*)-012-00-8HN31	68.70	71.70	4.30
Inconel	1/4"	K43(*)-012-00-8HN31	75.80	78.50	6.70
316 SS	1/8"	K28(*)-012-00-8HN31	61.80	64.80	1.40
316 SS	3/16"	K38(*)-012-00-8HN31	64.00	67.00	2.30
316 SS	1/4"	K48(*)-012-00-8HN31	68.40	71.40	3.70
Type E (Chromel-Constantan) Thermocouple, 32° to 1600°F**					
316 SS	1/8"	E28(*)-012-00-8HN31	63.20	66.20	1.60
316 SS	3/16"	E38(*)-012-00-8HN31	65.80	68.80	2.50
316 SS	1/4"	E48(*)-012-00-8HN31	69.40	72.40	4.40
Type T (Copper-Constantan) Thermocouple, -300° to 700°F					
316 SS	1/8"	T28(*)-012-00-8HN31	62.70	65.70	1.80
316 SS	3/16"	T38(*)-012-00-8HN31	65.80	68.80	2.50
316 SS	1/4"	T48(*)-012-00-8HN31	70.90	73.90	4.30

\*Please specify junction type: G=Grounded, E=Exposed, U=Ungrounded. Insert the correct letter designation in place of the (\*).

\*\*Do not use 316 SS above 1650° F

To select a longer or shorter custom sheath length, insert the desired length (in inches) in the three digits before the (\*) (012=12" as shown above). For lengths over 12", be sure to include the appropriate price adder per 6" additional length. There is no price reduction for lengths under 12".

### Optional Termination Head Materials Available!

For Optional Head...	Replace -31 with	Add to Price
Polypropylene Screw Cover	-63	\$-3.00
Cast Iron Screw Cover	-34	6.00
Cast Iron/Aluminum Explosion Proof	-71	22.00
Stainless Steel Head	-91	95.00

**For thermocouple extension wire, see page 122. Need a compression fitting? Call us!**

# Thermocouples with Matching Thermowells

- Our most commonly requested thermocouples and matching thermowells
- Most common materials listed
- Complete with cast aluminum protection head
- Wells available with 1/2", 3/4", and 1" process connections



We've made it easy for you to select thermocouples with matching thermowells. It's as easy as 1, 2, 3!

1. Select the process connection, well length, and material.
2. Add the matching thermocouple, just by inserting the thermocouple type desired in place of the ?
3. Add the 2 prices and part numbers together and you have a complete catalog number with pricing!

**Please remember that when wiring thermocouples, red is always negative.**

Already have a thermowell, but need a replacement thermocouple? Just find the thermowell dimensions in the chart and select the thermocouple. It's that easy!

We use only spring-loaded thermocouples with our thermowells. Why? Because spring-loading ensures positive contact with the thermowell tip, so the sensor responds faster to temperature changes.

Standard sheath material of the thermocouples is 316 stainless steel and the 1/2" NPT connection that goes into the thermowell is carbon steel. Other materials (Inconel) are available if you are sensing temperatures above 1650° F. For more information, just give us a call, we can make just about anything you can describe.

## Model Selection Guide

Well Selection						Thermocouple Selection					
Process Thread	Stem Length "A"	Insertion Length "U"	Well Diam. "D"	Shank Diam. "Q"	Catalog Number	Material and Price*				Catalog Number	Price Each
						Brass "B"	Steel "S"	304 SS "304"	316 SS "316"		
1/2"	2-1/2"	1-1/8"	1/2"	1/2"	49-*	\$21.45	\$13.86	\$21.45	\$26.73	248U-02.5-SL-6HN31	\$66.40
1/2"	4"	2-1/2"	1/2"	1/2"	99-*	23.10	16.83	23.10	28.38	248U-004-SL-6HN31	66.40
1/2"	6"	4-1/2"	1/2"	5/8"	185-U4 1/2-*	29.37	21.12	29.37	35.97	248U-006-SL-6HN31	66.40
1/2"	9"	7-1/2"	1/2"	5/8"	185-U7 1/2-*	44.59	35.71	44.59	59.99	248U-009-SL-6HN31	66.40
1/2"	12"	10-1/2"	1/2"	5/8"	185-U10 1/2-*	54.57	46.15	54.57	73.37	248U-012-SL-6HN31	66.40
1/2"	15"	13-1/2"	1/2"	5/8"	185-U13 1/2-*	69.63	58.21	69.63	94.45	248U-015-SL-6HN31	70.10
1/2"	18"	16-1/2"	1/2"	5/8"	185-U16 1/2-*	84.69	70.27	84.69	115.52	248U-018-SL-6HN31	70.10
1/2"	24"	22-1/2"	1/2"	5/8"	185-U22 1/2-*	114.82	94.40	114.82	157.69	248U-024-SL-6HN31	73.80
3/4"	2-1/2"	1-5/8"	1/2"	1/2"	50-*	21.45	13.86	21.45	26.73	248U-02.5-SL-6HN31	66.40
3/4"	4"	2-1/2"	1/2"	1/2"	100-*	23.10	16.83	23.10	28.38	248U-004-SL-6HN31	66.40
3/4"	6"	4-1/2"	1/2"	3/4"	200-U4 1/2-*	29.37	21.12	29.37	35.97	248U-006-SL-6HN31	66.40
3/4"	9"	7-1/2"	1/2"	3/4"	200-U7 1/2-*	44.59	35.64	44.59	59.99	248U-009-SL-6HN31	66.40
3/4"	12"	10-1/2"	1/2"	3/4"	200-U10 1/2-*	54.57	46.15	54.57	73.37	248U-012-SL-6HN31	66.40
3/4"	15"	13-1/2"	1/2"	3/4"	200-U13 1/2-*	69.63	58.21	69.63	94.45	248U-015-SL-6HN31	70.10
3/4"	18"	16-1/2"	1/2"	3/4"	200-U16 1/2-*	84.69	70.27	84.69	115.52	248U-018-SL-6HN31	70.10
3/4"	24"	22-1/2"	1/2"	3/4"	200-U22 1/2-*	114.82	94.40	114.82	157.69	248U-024-SL-6HN31	73.80
1"	2-1/2"	1-5/8"	1/2"	1/2"	51-*	25.74	19.47	25.74	32.01	248U-02.5-SL-6HN31	66.40
1"	4"	2-1/2"	1/2"	1/2"	101-*	31.35	24.75	31.35	36.96	248U-004-SL-6HN31	66.40
1"	6"	4-1/2"	1/2"	7/8"	201-U4 1/2-*	42.24	29.04	42.24	48.51	248U-006-SL-6HN31	66.40
1"	9"	7-1/2"	1/2"	7/8"	201-U7 1/2-*	54.57	46.15	54.57	73.37	248U-009-SL-6HN31	66.40
1"	12"	10-1/2"	1/2"	7/8"	201-U10 1/2-*	67.53	52.16	67.53	90.77	248U-012-SL-6HN31	66.40
1"	15"	13-1/2"	1/2"	7/8"	201-U13 1/2-*	87.13	67.23	87.13	111.86	248U-015-SL-6HN31	70.10
1"	18"	16-1/2"	1/2"	7/8"	201-U16 1/2-*	106.73	82.29	106.73	142.64	248U-018-SL-6HN31	70.10
1"	24"	22-1/2"	1/2"	7/8"	201-U22 1/2-*	145.94	112.41	145.94	194.50	248U-024-SL-6HN31	73.80

- Please specify thermowell material by replacing \* in catalog number with the appropriate letter or number designation (B, S, 304, or 316).
- Replace the ? in the thermocouple part number with the thermocouple type you need (J or K, E, or T).

Prices shown are for Type J or K thermocouple.

**For thermocouple extension wire, see page 122.**  
**Need a compression fitting? Call us!**

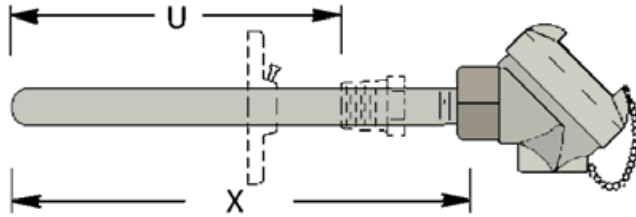
## Optional Termination Head Materials Available!

For Optional Head...	Replace -31 with	Add to Price
Delrin Screw Cover	-53	\$2.00
Cast Iron Screw Cover	-34	6.00
Cast Iron/Aluminum Explosion Proof	-71	22.00
Stainless Steel Head	-91	95.00

**For information on thermocouple initial material tolerances and thermocouple type color codes, see page 489.**



# Metal Protection Tube Thermocouple Assemblies



The straight-base assemblies shown on this page are those most commonly used. Other combinations are available by calling Lesman.

All assemblies on this page include our standard cast iron screw cover head with terminal block.

## Model Selection Guide

Make one selection from each table section. *Example:* J11C-8-50-18-H-8D12 is a Type J11 gauge thermocouple with a 18" 316 SS protection tube, 3/4" NPT 316 SS. Bushing welded 12" from the tip with an adjustable steel mounting flange.

Protection Tube X X = Length (In.)	Tube Size	Catalog Number	Length				
			12"	18"	24"	30"	36"
Type J (Iron Constantan) Thermocouple — 8 Gauge Element							
316 Stainless Steel	1/2"	J8C-8-50-X X-34	112.80	125.10	137.40	149.70	162.00
316 Stainless Steel	3/4"	J8C-8-75-X X-34	107.90	121.70	135.50	149.30	163.10
Inconel 601	1/2"	J8C-7-50-X X-34	136.40	180.70	225.00	269.30	313.60
Inconel 601	3/4"	J8C-7-75-X X-34	163.90	222.70	281.50	337.30	399.10
Type J (Iron Constantan) Thermocouple — 11 Gauge Element							
316 Stainless Steel	1/2"	J11C-8-50-X X-34	101.30	112.30	123.30	134.30	145.00
316 Stainless Steel	3/4"	J11C-8-75-X X-34	105.30	121.10	136.90	152.70	168.50
Inconel 601	1/2"	J11C-7-50-X X-34	133.80	177.80	221.80	265.80	309.80
Inconel 601	3/4"	J11C-7-75-X X-34	161.30	218.80	276.30	333.80	391.30
Type J (Iron Constantan) Thermocouple — 14 Gauge Element							
316 Stainless Steel	1/2"	J14C-8-50-X X-34	99.50	109.60	119.70	129.80	139.90
Inconel 601	1/2"	J14C-7-50-X X-34	132.00	175.10	218.20	261.30	304.40
Type K (Chromel-Alumel) Thermocouple — 8 Gauge Element							
316 Stainless Steel	1/2"	K8C-8-50-X X-34	74.70	89.30	103.90	118.50	133.10
316 Stainless Steel	3/4"	K8C-8-75-X X-34	78.70	94.80	110.90	127.00	143.10
Inconel 601	1/2"	K8C-7-50-X X-34	141.20	188.80	236.40	284.00	331.60
Inconel 601	3/4"	K8C-7-75-X X-34	168.70	229.80	290.90	352.50	414.10
Type K (Chromel-Alumel) Thermocouple — 11 Gauge Element							
316 Stainless Steel	1/2"	K11C-8-50-X X-34	71.50	84.60	97.70	110.80	123.90
316 Stainless Steel	3/4"	K11C-8-75-X X-34	75.50	90.10	104.70	119.30	133.90
Inconel 601	1/2"	K11C-7-50-X X-34	138.00	184.10	230.20	276.30	322.40
Inconel 601	3/4"	K11C-7-75-X X-34	165.50	225.10	284.70	344.30	403.90
Type K (Chromel-Alumel) Thermocouple — 14 Gauge Element							
316 Stainless Steel	1/2"	K14C-8-50-X X-34	66.40	76.90	87.40	97.90	108.40
Inconel 601	1/2"	K14C-7-50-X X-34	132.90	179.00	225.10	271.20	317.30
Assembly Options (Omit if no option is required.)					Catalog Number		Price
Adjustable Steel Mounting Flange					-H-		15.00
Cast Iron/Aluminum Explosion-Proof Head					-71-		50.00
Thermocouple Insulated from Protection Tube					-L-		8.00
3/4" NPT Steel Welded Bushing (1/2" Pipe Only)					-6D U U*		17.00
1" NPT Steel Welded Bushing (1/2"/3/4" Pipe Only)					-6E U U*		17.00
1 1/4" NPT Steel Welded Bushing (1/2"/3/4,"1" Pipe Only)					-6F U U*		17.00
1 1/2" NPT Steel Welded Bushing (1/2"/3/4,"1" Pipe Only)					-6G U U*		17.00
3/4" NPT 316 SS Welded Bushing (1/2" Pipe Only)					-8D U U*		74.00
1" NPT 316 SS Welded Bushing (1/2"/3/4" Pipe Only)					-8E U U*		74.00
1 1/4" NPT 316 SS Welded Bushing (1/2"/3/4,"1" Pipe Only)					-8F U U*		74.00
1 1/2" NPT 316 SS Welded Bushing (1/2"/3/4,"1" Pipe Only)					-8G U U*		74.00

U U\* = Substitute the insertion length (in inches) measured from tip to bottom of bushing for the U U. Omit this length if you would like the bushing supplied loose on the protection tube.

## Need Thermocouple Parts or Accessories?

All of our thermocouple parts and accessories are available to ship within 5 working days! Call for current pricing and available materials and sizes.

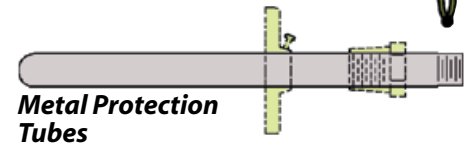
### Straight Elements



### Straight Bare Elements

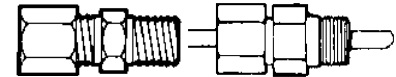


### Angle Elements

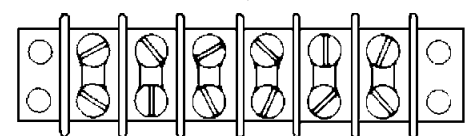


### Metal Protection Tubes

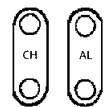
### Readjustable Compression and Spring-Loaded Fittings



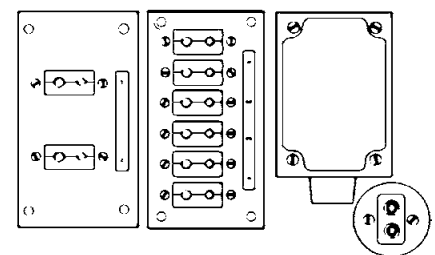
### Thermocouple Alloy Terminal Blocks



### Spade Lugs and Terminal Lugs



### Standard Size and Mini Jack Panels



### Thermocouple Element Insulators



**Call 800-953-7626.**

# Thermocouple Wire and Thermocouple/RTD Extension Wire

## Helpful Hints

1. Use thermocouple wire to make thermocouple elements or to connect thermocouples to instrumentation. **Extension wire should be used only to connect thermocouples to instrumentation.** Match the wire with the thermocouple to be used.
2. Select wire insulation compatible with the application environment. For applications requiring moisture resistance, use Teflon, PVC, Kapton, and Tefzel. For applications requiring high temperature insulations, use fiberglass, Vitreous Silica, and ceramic fiber.
3. Use stranded conductor wire to connect thermocouples where continuous or frequent flexing of the leadwire occurs.
4. Use metal overbraids and leads in flexible armor to provide protection against physical abuse to wiring.
5. Use leadwire with aluminum Mylar shields and drain wires to connect sensors to computers and protect against EMF stray signals.
6. **Do not** run thermocouple leads in conduits that carry power wiring. **Do not** run conduit carrying thermocouple leads parallel to electric buss bars or heavy power-carrying conduits. Cross them at right angles.
7. When connecting these wires to instrumentation, **red is always negative.** The other color-coded wire is **always positive.**



*We reserve the right to ship  $\pm 10\%$  of the length ordered, unless an exact requirement is clearly specified on the order.*

## Thermocouple Wire and Thermocouple Extension Wire

\*Standard lengths are 50, 100, 250, 500, and 1000 feet.

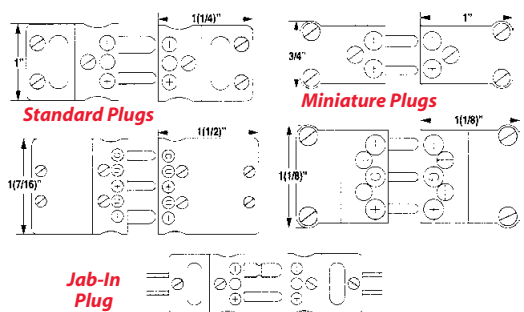
Wire Gauge	Wire Type	Insulations		Continuous Temp. Rating	Abrasion Resistance	Moisture Resistance	Catalog Number	Price per Foot	
		Each Conductor	Exterior Cover					Std.* Length	Non-Std. Length
Thermocouple Wire Type J ANSI Color Code: Negative Wire = Red, Positive Wire = White, Overall = Brown									
20	Solid	Glass Braid	Glass Braid	900°F	Fair	Good	J20-1-304	\$0.34	\$0.39
20	Solid	Teflon (FEP) Extruded	Teflon (FEP) Extruded	400°F	Very Good	Excellent	J20-1-507	0.47	0.52
20	Strd.	Teflon (FEP) Extruded	Teflon (FEP) Extruded	400°F	Very Good	Excellent	J20-3-507	0.64	0.69
Thermocouple Extension Wire Type JX ANSI Color Code: Negative Wire = Red, Positive Wire = White, Overall = Black									
16	Solid	Polyvinyl	Polyvinyl	-20 to 221°F	Good	Excellent	J16-5-502	0.54	0.59
20	Solid	Polyvinyl	Polyvinyl	-20 to 221°F	Good	Excellent	J20-5-502	0.23	0.28
20	Solid	Polyvinyl	Twisted, Alum. Mylar PVC	-20 to 221°F	Good	Excellent	J20-5-510	0.27	0.32
20	Strd.	Polyvinyl	Polyvinyl	-20 to 221°F	Good	Excellent	J20-7-502	0.29	0.34
Thermocouple Wire Type K ANSI Color Code: Negative = Red: Positive = Yellow, Overall = Brown									
20	Solid	Glass Braid	Glass Braid	900°F	Fair	Good	K20-1-304	0.92	0.97
20	Solid	Teflon (FEP) Extruded	Teflon (FEP) Extruded	400°F	Very Good	Excellent	K20-1-507	0.76	0.81
Thermocouple Extension Wire Type KX ANSI Color Code: Negative Wire = Red, Positive Wire = Yellow, Overall = Yellow									
16	Solid	Polyvinyl	Polyvinyl	-20 to 221°F	Good	Excellent	K16-5-502	0.97	1.02
20	Solid	Polyvinyl	Polyvinyl	-20 to 221°F	Good	Excellent	K20-5-502	0.48	0.53
Thermocouple Extension Wire Type SX and RX ANSI Color Code: Negative Wire = Red, Positive Wire = Black, Overall = Green									
16	Solid	TFE Tape/Heavy Glass Braid	ServTex Braid	Up to 550°F	Good	Good	S16-5-157	1.14	1.19
20	Solid	Glass Braid	Glass Braid	Up to 900°F	Fair	Good	S20-5-304	0.39	0.44

## Special Construction RTD Extension Wire

\*Standard lengths are 50, 100, 250, 500, and 1000 feet. See Lesman for nonstandard length pricing.

Wire Type	Construction Style	Each Conductor	Insulation Inner Jacket	Insulation Outer Jacket	Temp. Rating	Color Code	Outer Jacket	Catalog Number	Price* per Ft.
Triplex	24-Stranded (Silver-Plated Copper)	TFE Teflon	None	FEP Teflon	400°F	Red, Red, Wht.	White	RT24-3-527	\$0.68

## Plugs and Jacks



Description	Pin Spacing	Temp Rating	Plugs		Jacks	
			Catalog No	Price	Catalog No	Price
Two Hollow Pins	7/16"	350°F	61_	\$4.20	62_	\$4.00
Two Hollow Pins	7/16"	500°F	61_-M	5.90	62_-M	6.20
Three Hollow Pins	7/16"	350°F	61_-3	8.60	62_-3	6.30
Two Jab-In Solid Pins, 14Ga max.	7/16"	350°F	61_-J	13.60	62_-J	15.30
Two Jab-In Solid Pins, 8Ga max.	7/16"	350°F	61K-E	14.00	62K-E	16.60
Two Solid Pins	7/16"	800°F	61_-H	17.60	62_-H	14.60
Two Pins	5/16"	350°F	63_	4.70	64_	3.60
Three Pins	5/16"	350°F	63_-3	4.00	64_-3	3.60
Two Pins	5/16"	500°F	63J-M	4.00	64J-M	4.40
Two Pins	5/16"	500°F	63K-M	4.00	64K-M	4.10

Insert calibration code in \_. Use thermocouple type (E, J, K, N\*, T, R, S) or U for RTD. \*Type N available in 61\_ and 63\_ only.

# SOLOnet Web-Ready Infrared Thermometer

## Features

- Laser targeting for accurate spot measurements
- Survives harsh environments and ambient temperatures up to 158°F with no added cooling requirement
- Protection assemblies available for air and water cooling in ambient temperatures to 250°F or for extreme radiant heat
- Field-adjustable focal length — four distances in one unit. Pick one when you order, and change in the field by swapping focus rings to suit your changing needs.
- Sapphire protection window standard on all units
- Web- and network-ready with optional interface unit
- No signal processor unit or special software needed
- Rugged aluminum housing, IP65, NEMA 4X
- Calibrated to ISO 19075
- Two-year warranty

Four different SOLOnet thermometer models give you the choice of operating wavelength, variants, laser alignment, and measurement ranges from 382° to 3182°F. The measurement span can be selected anywhere within the thermometer range, with a minimum span of 90°F.

SOLOnet can be used in stand-alone, single point, or multipoint installations with individual remotely-adjustable sub-temperature ranges, current outputs, emissivity, or non-greyness compensation and user-defined alarm settings. Choice of built-in peak picker, track and hold, or averager signal processing functions ensures accurate measurement in complex processes.

The optional DIN rail mounted SOLOnet Webserver/Ethernet Interface unit provides a wide choice of configuration, interconnection, system monitoring, and maintenance options.

For ease of configuration, live temperature data is displayed on a PC's web browser, together with related measurement parameters. All parameters are easily adjusted and saved using drop-down menus or text boxes. Advanced users will benefit from a lower-level interface with direct messaging via Ethernet or addressable RS485.

If you choose not to purchase the webserver/ethernet interface, Land Instruments offers a free one-time setup of alarms, emissivity, and peak-picker parameters. Then, all you do is connect the SOLOnet to its cable, mount the unit, and it's ready to go!

## Specifications

Model	SN11	SN21	SN51	SNR1
<b>Range (°F)</b>	1022° to 3182°	482° to 2372°	392° to 2012°	1292° to 3182°
<b>Wavelength</b>	1 µm	1.6 µm	5 µm	1 µm ratio
<b>Field of View</b>	100:1	100:1	50:1	100:1
<b>Response</b>	10ms	10ms	50ms	10ms
<b>Stability</b>	0.2°/°	0.2°/°	0.2%K/K	0.05K/K
<b>Accuracy</b>	0.3%K	2K	0.35%K	0.6%K

**Focus:** Fixed, user configurable; 9.8", 19.7", 39.4", and infinity

**Output:** 0 to 20 mA or 4 to 20 mA, user selectable, isolated 50V

**Ambient Limits:** 32° to 158° operating, water-cooled units can operate at temps to 250°F with insulated cables. Non-insulated cables good to 176°F

**Power Supply:** 18 to 30 VDC (24 VDC nominal)

**Laser Sighting:** Laser defining optical axis, Class 2, 1mW, 650 nm, 120s ON duration, automatic switch-off

**Alarms:** High, low, internal temperature, emissivity/NG signal lost

**See page 484 for emissivities of common materials.**

**AMETEK LAND**



**Not sure what Ametek Land product is right for you?**

Fill out the infrared thermometry datasheet at [www.Lesman.com/datasheets](http://www.Lesman.com/datasheets) and fax it to Lesman for review.

## Ordering Instructions

Make one selection from each table section. A finished catalog number looks like this: SN11Y (250mm) with 800858. A complete order includes the thermometer and a prewired connector cable (ordered separately below).

## Model Selection Guide

Address orders to: Ametek Land Inc.,  
c/o Lesman Instrument Company

Description			Catalog Number	Price Each
Land SOLOnet Digital Infrared Thermometer with Laser Sighting				
Wavelength	°F	°C		Call for Prices
1 micron	1022° to 3182°	550° to 1750°	800791*	
1 micron ratio	1292° to 3182°	700° to 1750°	800794*	
1.6 micron	482° to 2372°	250° to 1300°	800792*	
5 micron	392° to 2012°	200° to 1100°	800793*	
Connecting Cable	3m (10 foot) Prewired		800858	
	15m (50 foot) Prewired		800859	
Assembly	25m (82 foot) Prewired		800860	
Protection Hardware	Water-Cooled Jacket with Air Purge		800861	
	Air-Cooled Jacket with Air Purge		800862	
	Air Purge with Mounting Plate		800863	
Mounting	Single Axis Adjustable Mounting Bracket		800707	
	Dual Axis Adjustable Mounting Bracket		800708	
Accessories	SN-W/E Webserver/Ethernet Interface Unit		800907	
	CAT5/6 Patch Cable, 7' SN-W/E to Switch		203.897	

**Call for Prices**

\*Unit focal distance is configured at the factory.

Specify 250mm, 500mm, 1000mm, or Infinity. e.g., (800791 @250mm)

All models can be reconfigured in the field, through adjustable rings, without loss of calibration.



## System 4 for Advanced Infrared Radiation Thermometry

System 4 non-contact temperature measuring systems are designed for continuous quality and process monitoring and control in a wide range of applications — metal production, processing, foundry and forging, glass, electronics, mineral processing and petrochemical — where accurate measurement of temperature is vital.

No other method of temperature measurement offers the benefits of non-contact infrared radiation thermometry.

- Infrared thermometer systems continuously measure the temperature of hot, moving or inaccessible materials accurately and from a safe distance.
- Sensing heads do not require contact with the target object, so they can't interfere with, damage, or contaminate the product they are measuring.
- Thermometers don't remove heat or disturb the process being monitored, and offer the only solution when the product is small, fragile or in a vacuum or controlled atmosphere.

### Thermometers

Infrared radiation thermometers do not require contact with the target object, so they cannot interfere with, damage, or contaminate the product they are measuring. They do not remove heat or disturb the process being monitored and offer the only solution when the product is moving, small, fragile, or in a vacuum or controlled atmosphere.

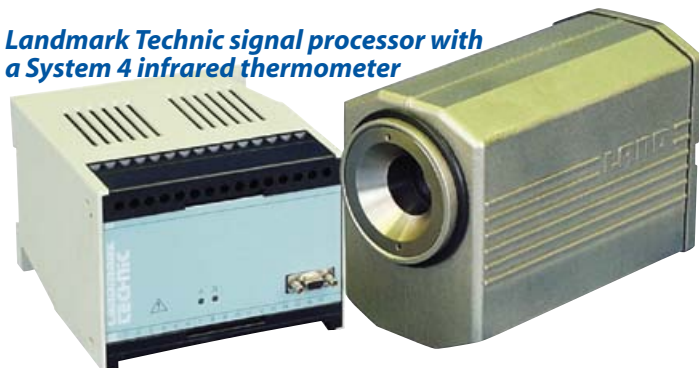
System 4 thermometers all feature temperature spans and operating wavebands selected to ensure optimum accuracy of measurement for each application. Any System 4 thermometer can be used with any System 4 Landmark processor, allowing you to build a temperature measurement system designed specifically to your application.

- Focusable optics — guaranteeing a minimum of 98% of target energy within the lens graticule.
- Additional close-up lenses for standard bodied thermometers for targets as small as 0.45mm/0.020 in
- Flexible fiberoptics light guide versions — with optional laser targeting system to define target size and position
- Traceable, individual calibration — giving flexible systems with unrestricted interchangeability
- Long term accurate, reliable and drift-free measurement
- Rugged design with a wide range of mounting accessories

Standard thermometers feature precision through-the-lens focusable optics that guarantee exact viewing and accurate measurement of the smallest of target areas.

Single wavelength thermometers are intended for general purpose use as well as solving problems in specific applications. Fiberoptic thermometers are used to measure the temperature of materials where the target is difficult to access, and where high temperature or high magnetic fields prevent the use of other types of sensors.

### Landmark Technic signal processor with a System 4 infrared thermometer



**Call Lesman for assistance with Ametek LAND System 4 infrared thermometry systems.**

**Fill out the infrared thermometry datasheet at [www.Lesman.com/datasheets](http://www.Lesman.com/datasheets) and fax it to Lesman for engineering review.**

Ratio thermometers are used in difficult environments containing steam, smoke, or dust, or where the target is small or does not completely fill the field of view.

Proven reliable electronics and a high quality optical system are housed in a rugged diecast aluminum body with a robust electrical connector to provide reliable performance. All thermometers feature through-the-lens sighting. Adjustable focus with a circular graticule gives precise alignment on to the smallest of targets. Two optical variants are available: standard and short-focus.

**M1 thermometers:** For general purpose use in high temperature applications from 1850° to 4700°F (450° to 2600°C). They use a silicon cell detector, operate at short wavelengths and have a fast response time of 5ms to 95%.

**M2 thermometers:** Range to 600°F (300°C) with a fast response time of 5ms. M2s operate at a wavelength of 1.6  $\mu$ m, using latest generation of germanium detectors.

**M4 thermometers:** Measure from 150° to 1000°F (50° to 550°C). Used on low temperature, low or uncertain emissivity surfaces such as bright or un-oxidized metals. They use lead sulfide detectors in a unique null balance mode to guarantee stability.

**M5 thermometers:** Fast response speed, small target size and accurate sighting make the M5 thermometers ideal for all flat glass, glass toughening and optical fiber applications.

**M6 thermometers:** Short wavelength thermometers that measure from 50° to 1300°F (0° to 700°C). Designed specifically for lower temperature applications (metal processing, glass lehr, food, paper, rubber and textiles).

**M7 thermometers:** Measure from 75° to 700°F (25° to 375°C), operating at a waveband selected especially for measurement on plastic films as thin as 20 microns (1 mil)

**M8 thermometers:** Measure from 30° to 1830°F (0° to 1000°C). Ideal for food, textiles, paper and plastics applications.

**R1 ratio thermometers:** Measuring range is 1100° to 4700°F (600° to 2600°C). For difficult, high temperature applications where the field of view is not fully filled or where the sight path is obscured.

## System 4 Landmark Processors

A Landmark signal processor — panel or DIN rail mounted — uses high speed inputs, real time signal processing and flexible outputs to convert the output of each sensor into real process variables.

Landmark TECHNIC is a high precision, DIN-rail mounted intelligent digital processor. Its features include adjustable emissivity/non-greyness, peak picker, averager, track and hold, alarm and 4 to 20mA outputs, and RS232C serial communications for setup via a PC.

- Standard DIN-rail mounting — requires no panel space
- Standard time functions — average, peak picker and track and hold
- 4 to 20 mA output and alarm output
- Remote input for Track and Hold
- Emissivity/non-greyness adjustment
- Setup performed using a PC and configuration software
- Indicator (LMi) and power supply are also available

RS232C serial communications provide a remote interface between the processor and a PC for configuring the system parameters.

Landmark GRAPHIC is the state-of-the-art, panel mounted signal processor, designed to control and process data from any System 4 Thermometer. The multichannel processor accepts, processes, and simultaneously displays inputs from any combination of up to four separate thermometers. Multiple outputs can be integrated directly into any process monitoring, recording, or control system.

Landmark Graphic processors offer a variety of features and advanced time functions that present temperature data in a choice of displays and outputs to suit the particular application. They're rugged and extremely versatile, giving you more choice and more precision.

- Highest system accuracy
- Real time signal processing — peak picker, averager with selectable time constant, and track/hold functions
- User-friendly backlit LCD interface with large numeric and graphic displays and tactile keypad — simultaneous display of up to four different thermometers at once!
- Two high/low alarms for use in On/Off control
- Unique multichannel and math function options
- 0 to 20mA, 4 to 20mA and 1mV/° outputs to suit any control system
- RS232C and RS485 serial communications option

Two Landmark Graphic processors are available; a single thermometer version, and a multichannel version that can be configured to work with up to four different System 4 thermometers simultaneously, and can apply user-configured math functions to the thermometers' measurement signals.

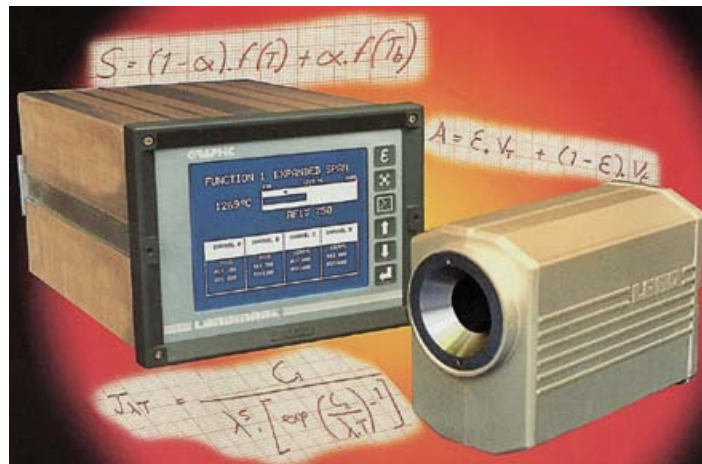
The processor supplies power to each thermometer and the control signals required for either emissivity or non-greyness compensation. A large LCD display shows temperature and parameter variables, and system outputs.

### Landmark Graphic Multichannel Capability

The multichannel Landmark Graphic processor provides up to four fully featured, independent measurement systems in one package.

Any System 4 thermometer can be connected to any input channel of the processor. Each channel is fully independent of the other; the inputs are not multiplexed. Additional channels may be added as required without affecting existing settings.

The processor can control all types of thermometers simultaneously. The thermometers can have different temperature ranges and units (°C or °F). Each channel has identical features to the single channel version and two fully scalable analog outputs. Two alarm outputs, both either



**Two independent math functions can be specified on the System 4 Landmark Graphic processor.**

High or Low activated, each with the changeover relay, are provided on every channel card.

### Math Functions

Two independent math functions are provided with the Landmark Graphic. Each can calculate, display and output either the maximum, minimum, mean, difference or range of temperatures measured.

Each math function is fully independent of the other, and both are independent from the four individual thermometer temperature output channels. Each function has both a current output, either 0 to 20 mA or 4 to 20mA, and a single relay alarm output.

The expanded span function allows you to extend the span of your temperature measurement system from the minimum temperature of the thermometer with the lowest range, to the maximum temperature of the thermometer with the highest range.

### Easy Configuration

Landmark Graphic is easy to configure using the text based, setup menu system. Once the thermometer type has been entered, the processor automatically configures the appropriate input data.

You can then select the required temperature span for the output current range, target emissivity/non-grayness values and a range of time functions and alarm settings to match your exact needs. All parameter settings are entry code protected.

Customer connections are also made as easy as possible, using two-part demountable terminal strips located on the rear panel. The modular construction of System 4 ensures easy system expansion.

### Mounting Options

System 4 includes an extensive range of mountings and accessories that provide protection and accurate alignment for both standard and fiberoptic thermometers.

All mountings permit quick, tool-free installation and removal of thermometers, keeping downtime to a minimum.



**See page 484 for emissivities of common materials.**

**Call Lesman for pricing and availability.**



# Landscan LSP Infrared Linescanner

**AMETEK LAND**

## Features

- Compact size with a robust sapphire window
- Wide scan 80° angle, 100:1 field of view
- Adjustable scan speed, 10 to 100 Hz
- Built-in Class 2 laser to define scan plane and angle
- Single cable connection between scanner and processor
- Powerful software with single and multichannel digital/analog inputs and outputs
- Wide range of protection and mounting accessories

Ametek Land's Landscan LSP high speed, wide angle infrared linescanning systems are designed for accurate process imaging and temperature measurement in a wide range of applications from 68° to 2552°F.

The LSP series linescanner head is extremely compact, with a minimized depth and base footprint for installation in restricted spaces, designed to reduce heat absorption. A built-in laser targeting system aids in target alignment. LSP systems have extensive storage, display, and analysis capabilities, processing temperature data from multiple sensor heads, and database and archive files simultaneously.

**LSP5:** For forming, annealing, and tempering. LSP5FL is ideal for use in the hostile environment of the float glass line, and is available with dedicated rugged protection mounting and assemblies.

## This just in...

*LSP-HD line scanner*

- Up to 1000 samples per scan line and a faster scan rate
- Standard with Ethernet connectivity in the scanner head and Power-over-Ethernet (IEEE 802.3at)



**LSP6:** Low temperature linescanners for process imaging and control applications.

**LSP71:** Narrow spectral response makes it ideal for process imaging and temperature control of hydrocarbon thin plastics.

Consistent, accurate temperature data is critical in the thermoforming process, to ensure that the finished product is correctly formed. Low forming temperature produces stresses in the formed part, and temperatures that are too high can cause blistering and loss of color or gloss.

The new Landscan control processors include 19" rack-mount and the compact wall/back-of-panel-mount units, all of which provide serial and Ethernet outputs for temperature data. All units can interface to local process control systems or Landscan software.

## Linescanner Model Specifications

Address orders to: **Ametek Land Inc.,**  
c/o Lesman Instrument Company

Model	LSP60	LSP61	LSP71	LSP62	LSP5FL	LSP50	LSP20	LSP21	LSP52	LSP10
Measuring Range	68° to 482°F	122° to 752°F	122° to 662°F	212° to 1112°F	302° to 1382°F	302° to 1382°F	392° to 1562°F	572° to 1832°F	932° to 2012°F	1112° to 2552°F
Scan Speed	50 Hz Preset		10-100 Hz Adjustable	50 Hz Preset	20 Hz Preset	50 Hz Preset	10-100 Hz Adjustable		50 Hz Preset	10-100 Hz Adjustable
Spectral Response	3 to 5 μm		3.4 μm	3 to 4.2 μm	5 μm		2.4 μm	1.9 μm	5 μm	1 μm
Response Speed	≤ 10 μs	≤ 5 μs	≤ 10 μs	≤ 5 μs	≤ 7 μs		≤ 1 μs		≤ 7 μs	≤ 1 μs
Resolution										
<15% range	5.4°F	3.6°F						6.3°F	4.5°F	7.2°F
>15% range	2.7°F	1.8°F						3.6°F	4.5°F	3.6°F
Drift	≤ 1° Indicated/10° ambient			≤ 2° Indicated/10° ambient			≤ 1° Indicated/10° ambient		≤ 3° Ind./10° ambient	≤ 1° Ind./10° ambient

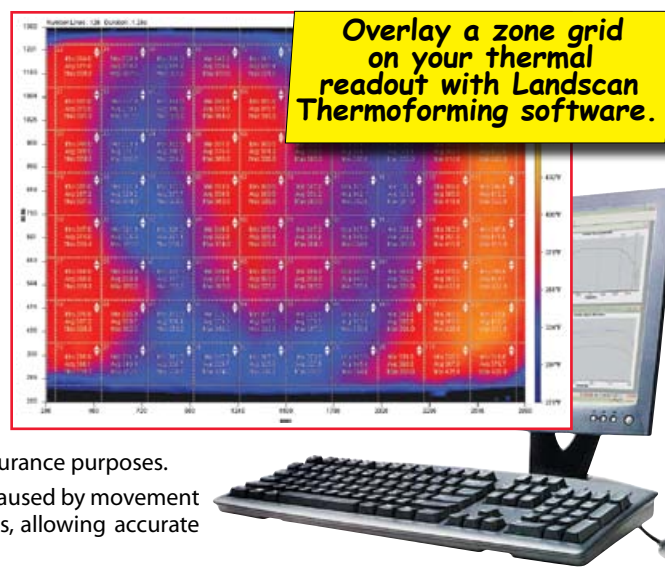
**See page 484 for emissivities of common materials.**

## Software Features

- Simple installation with customized configurations
- Extensive storage, display, and analysis capabilities
- Simultaneous process temperature data from multiple sensor heads, database, and archive files
- Displays include thermal map, temperature profiles, 3-D, two independent zone models, center-line deviation, subtracted thermal map, and envelope profile
- Spot temperatures analyzed at any point
- Detailed user-defined zone temperature analysis
- Flexible digital and analog input/output options

The new Landscan Thermoforming software is specifically designed to provide critical information through live configurable displays, process control system interfaces, and product database/statistical summaries for quality assurance purposes.

The software calculates and corrects for the distortion of thermal profiles caused by movement of the heated sheet on rotary machines during the thermoforming process, allowing accurate determination of zone heating temperatures.





## FTI-E Fixed Thermal Imaging Systems

*Provide your plant operators real-time information for quality control and process data*

- Record ideal thermal profile and continuously monitor to check deviations in the process for comparative analysis
- Trigger alarm conditions with thermal data for process and quality control
- Measure minimum, maximum, and average temperatures
- Record and playback thermal images of moving processes to pinpoint potential problems

### Features

- High resolution radiometric thermal image, transmitting detailed temperature information over a high speed digital connection
- Designed for harsh industrial environments, ensuring ultimate measurement reliability and availability
- Sealed industrial enclosure, designed for installation in the plant or the control room
- Optional industrial processor unit with touchscreen provides local display and control
- Wide ambient temperature capability (40° to 120°F) ensures that imager can be used in even the harshest environments
- Integrated manual pan-and-tilt mount makes it easy to align the unit after installation
- Flexible interface provides connections to a wide range of standard industrial interfaces — TCP/IP, OPC, analog signals, or alarm outputs
- High performance air purge design keeps lenses clean, for optimal performance in industrial environments
- Full range of analysis and process control functions: point or area temperature measurement, temperature profiles, histograms, isotherms, measurement trending, and digital zoom
- Thermal analysis software lets you monitor or control up to four imagers at full frame rate



Ametek Land's FTI-E process imaging system gives the plant operator a complete thermal view of the process, with a display that responds immediately to changes. These changes can be used to trigger alarms, automatically control other processes, and provide quality control data directly to the control room.

The FTI can be used in all types of applications, in the harshest plant conditions, operating continuously to provide fast response data. It can directly replace portable solutions that provide only a periodic check, to monitor availability and free up plant personnel to act on the data rather than capture it.

**FTI-E Thermal Imagers:** Four imagers are available, with different temperature ranges and 32° or 16° field-of-view, 4 x 3 format.

**FTI-E Control Processors:** Industrial processors provide local process control, configuration, and process visualizations.

**Industrial Housing:** Designed to protect the imager in even the harshest operating environments for reliable, continuous operation.

**LIPS FTI Software:** Real-time thermal analysis software uses the latest advances in image processing and digital communications to provide solutions for a wide range of processes. It is capable of monitoring or controlling up to four imagers at full frame rate, and transfer data via TCP/IP, optional OPC server, analog signal, or alarm output. The software automatically stores images and video in the event of an alarm.

### Specifications

Imager Model	FTI-E 800	FTI-E 801	FTI-E 490	FTI-E 391
<b>Measuring Range</b>	-4° to 250°F -20° to 120°C	120° to 660°F 50° to 350°C	300° to 1100°F 150° to 600°C	1100° to 2910°F 600° to 1600°C
<b>Ambient Range</b>	50° to 110°F 10° to 45°C	40° to 120°F 5° to 50°C		
<b>Spectral Response</b>	Nominal 8–14 μm		Nominal 5 μm	Nominal 3.9 μm
<b>Thermal Resolution</b>	<0.15°F <0.08°C	<0.3°F <0.15°C	<0.36°F <0.2°C	<0.54°F <0.3°C
<b>Measuring Accuracy</b>	±3°F ±1.5°C	±1% (±3° below 300°F)	±1%	±1%

**Detector:** Uncooled amorphous silicon focal plane array

**Frame Rate:** 30 frames per second

**Image Pixels:** 320 x 240

**Focusing Range:** 4x3 format; 32° field of view: 19" (0.5m) to infinity; 16° field of view: 39" (1m) to infinity

**System Measurement Drift with Ambient Temperature:** 0.2° indicated/1° ambient (°F or °C)

**Protection:** IP65/NEMA 4 enclosure

**Vibration:** 0.5mm, 10–60 Hz; 3g, 60–300 Hz

**CE Certification:** EN 61326:1999B

**Call Lesman for pricing and availability.**

Learn more at  
**Lesman.com**

# Choosing the Right Temperature Transmitter


**Honeywell** **SIEMENS** **△** **PYRAGON, INC.**

Model	Description and Programming Options	Inputs	Output	Accuracy	Prices Start at	See Page
<b>STT170</b> 	Programmable with STT17C software. Available with FM, CSA, and ATEX approvals 1500 VAC isolation.	T/C: B, E, J, K, L, N, R, S, T, U, W3, W5; Linear signals: $\Omega$ , mV RTD: Pt100, Pt1000, Ni100; (Varies by Model)	4 to 20 mA, HART®, Foundation Fieldbus	T/C: 0.1% span, 0.1 $\Omega$ or 10 $\mu$ V; RTD: 0.1% span	\$115.00	129
<b>2800T</b> 	DIN-rail or pipe mount, HART® programmable. Built-in digital display. FM, CSA approved. 500 VAC isolation.	T/C: B, E, J, K, N, R, S, T; RTD: Pt100, Pt200, Pt500, Ni, Cu; Linear input: -100 to 100 mV, 0 to 1000 $\Omega$	4-20 mA	$\pm 0.035\%$ span	\$395.00	135
<b>STT250</b> 	HART® or SCT3000 programmable, optional integral analog or digital indication meter.	T/C: B, E, J, K, N, R, S, T; RTD: Pt100, Pt100J, Pt200; Linear signals: $\Omega$ , mV	4-20 mA, HART®, or digital DE	$\pm 0.025\%$ span	\$480.00	130
<b>STT 350</b> 	Programmable with Honeywell MC Toolkit. Available with FM and CSA explosion-proof housing	T/C: B, C, D, E, J, K, N, R, S, T, NiNi-Moly, RH Radiamatic; RTD: Pt100, 100J, 200, 500, Cu10 or 25, Ni500; Linear signals: $\Omega$ , mV	4-20 mA, digital DE	$\pm 0.025\%$ span	\$892.00	131
<b>SITRANS TH100</b> 	Head-mount transmitter Programmable with SIPROM T Isolated 1kV input against output FM, ATEX approvals available	RTD: Pt100	4-20 mA	0.45°F or 0.1% span	\$105.00	132
<b>SITRANS TH200</b> 	Head-mount transmitter, Programmable with SIPROM T, Isolated 1kV input against output FM, ATEX approvals available	2-, 3-, 4-wire RTDs, Ohms; T/C: B, C, D, E, J, K, L, N, R, S, T, U; Linear signals: mV	4-20 mA	Varies by Input	\$255.00	133
<b>SITRANS TH300</b> 	Head-mount HART® transmitter, Programmable with SIMATIC PDM, Isolated 1kV input against output FM, ATEX approvals available	2-, 3-, 4-wire RTDs, Ohms; T/C: B, C, D, E, J, K, L, N, R, S, T, U; Linear signals: mV	4-20 mA, HART®	Varies by Input	\$368.00	133
<b>SITRANS TH400</b> 	Head-mount transmitter, Profibus PA model programmable with SIMATIC PDM; Foundation Fieldbus model programmable with 375 handheld and AMS; FM, ATEX approvals available	2-, 3-, 4-wire RTDs, Ohms; T/C: B, E, J, K, N, R, S, T, L, U, W3, W5; Linear signals: mV	Profibus PA or Foundation Fieldbus	Varies by Input	\$557.00	132
<b>SITRANS TF</b> 	Field transmitter for harsh environments. Programmable by SIMATIC PDM or SIPROM T, depending on built-in head transmitter. FM-approved units available. IP-68 rating	RTD: 2-, 3-, or 4-wire Pt25 to Pt1000, Ni25 to Ni1000, Cu25 to Cu1000; T/C: B, E, J, K, R, S, T, L, U, N, C, and D; Linear: 1100mV	4-20 mA, HART®	RTD: 0.18°F, T/C: 1.8° to 3.6°F mV: 40 $\mu$ V	\$423.00	134
<b>SITRANS TF2</b> 	Field transmitter with LCD and integrated sensor, stainless steel thermowell; Programmable via three front-face keys	RTD: Pt100	4-20 mA	$\pm 0.81^\circ\text{F} + \pm 0.2\%$ full scale	\$446.00	134

**Standard transmitter wiring diagrams available on page 489.**

# Honeywell Programmable Temperature Transmitters

## STT171 Features

- Analog 4-20 mA output
- RTD or Ohm input
- DIN Form B head mount
- NAMUR NE43 sensor error response
- Configurable using STT17C configuration tool and PC

## STT17H Features

- HART®/4-20 mA output
- RTD, thermocouple, Ohm, or mV input
- Single or dual (difference or average) sensor input
- DIN Form B head mount
- HART® multidrop capable
- NAMUR NE43 sensor error response
- Galvanic isolation
- Configurable using STT17C configuration tool and PC or HART® field communicator



## STT173 Features

- Analog 4-20 mA output
- RTD, thermocouple, Ohm, or mV input
- DIN Form B head mount
- NAMUR NE43 sensor error response
- Galvanic isolation
- Configurable using STT17C configuration tool and PC

## STT17F Features

- FOUNDATION™ fieldbus protocol, FISCO certified
- RTD, thermocouple, Ohm, or mV input
- Single or dual (difference or average) sensor input
- DIN Form B head mount
- Two analog and one PID function block
- Basic or LAS capability
- Galvanic isolation
- Configurable using Experion and field communicator

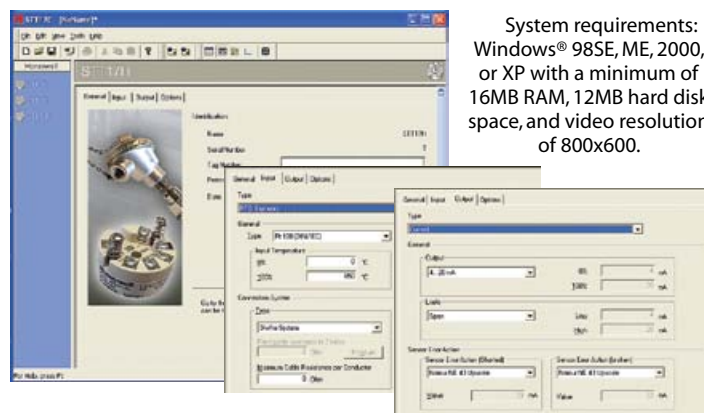


Honeywell's STT170 series of programmable temperature transmitters provides cost-effective solutions for temperature monitoring applications. Compared to direct-wired temperature sensor monitoring points, STT170 transmitters deliver increased accuracy, safety, and reliability—plus, they reduce wiring costs.

These transmitters automatically linearize the temperature output signal bounded by the user's upper and lower range values. STT170 models can also be programmed with high or low limit alarms that activate on sensor failure.

Once it's installed on a PC, the graphical interface of the STT17C software configuration tool virtually eliminates the need for operator training. The STT17C configuration toolkit contains all the software and transmitter interface hardware necessary to configure the STT171, STT173, and STT17H in non-hazardous work environments.

If you don't want to configure the transmitters yourself, you can order them factory-configured. Contact Lesman for the custom configuration datasheets.



System requirements:  
Windows® 98SE, ME, 2000, or XP with a minimum of 16MB RAM, 12MB hard disk space, and video resolution of 800x600.

## Condensed Specifications

**Ambient Operating Temperature:** -40° to 185°F (-40° to 85°C)

**Humidity:** 0% to 95% rH non-condensing; Operating: 5% to 100%

**Alarm Levels:** Programmable: 3.5–4 mA downscale, 20–23 mA upscale; NAMUR NE43 Upscale: 23 mA; NAMUR NE43 Downscale: 3.5 mA

**Approvals:** FM/CSA/ATEX

*Intrinsically Safe/Non-Incendive:* Class I Div, 1, Groups A-D, T4; Class 1, Zone 0/1, AEx ia IIC, T4; Class I, Div 2, Groups A-D, T4

*Intrinsically Safe/Non-Incendive:* Class I, Div 2, Groups A-D, T4; Class I, Zone 0/1, Ex ia IIC, T4; Class 1, Div 2, Groups A-D, T4

*Intrinsically Safe Zone 0/1:* Ex II 1 GD, EEx ia IIC, T4-T6; Ex II 2 (1) GD, T4-T6, when mounted in a Form B metal head mount enclosure per DIN 43729 that provides a degree of protection of at least IP6X in accordance with EN 60529, that is suitable for the application and correctly installed.

*Non-Incendive Zone 2:* Class I, Div 2, Groups A-D, T4; Ex II 3 G, EEx nA [L] T4-T6



Visit our website for complete specifications and manuals.

## Ordering Instructions

Make one selection from each table section. Check the availability column to be sure that the unit you need is available. A finished catalog number looks like this: **STT17 \_ \_ \_ \_ \_**

## Model Selection Guide

Description		Catalog Number	Availability			Price
4-20 mA Output, RTD Input		STT171-	↓			\$115.00
4-20 mA Output, Universal Input		STT173-	↓			225.00
HART® Protocol, 4-20 mA Output		STT17H-		↓		415.00
Foundation Fieldbus Protocol, Digital Output		STT17F-			↓	750.00
Approvals	FM/CSA/ATEX Intrinsically Safe	BS-	•	•	•	0.00
	FM/CSA/ATEX Non-Incendive	BN-	•	•	•	0.00
Sensor	No Integral Sensor Probe	0-	•	•	•	0.00
Configuration	Factory Default Configuration	00 _	•	•	•	0.00
	Custom Configuration*	T0 _	•	•	•	24.00
	Custom Calibration*	C0 _	•	•	•	24.00
Documentation	None	_ _ 0	•	•	•	0.00
	Cert of Conformance/Origin	_ _ R	•	•	•	24.00
Configuration Tool (STT171/173/17H)		STT17C-00-0-000	•	•	•	500.00
DIN Rail Clip		50017850-001	•	•	•	32.78

\*Includes Printed Configuration or Calibration Report



# STT250 Smart Temperature Transmitter

# Honeywell



## Features

- Reduces maintenance and inventory costs
- Instant alarm generation and post-read validation ensure security
- Failsafe options ensure reliable performance
- Optional integral digital indication meter
- Compact size for direct head mounting
- Available with HART® communications protocol

## Input Actuators

Input	Standard	Digital Accuracy Over Range			
		Normal (°F)		Maximum (°F)	
Pt100	IEC751:1986	-328 to 842	0.27	-328 to 1562	0.45
Pt200	(a=0.00385)	-328 to 842	0.54	-328 to 1562	0.72
Pt100J	JISC1604-81 (a=0.00392)	-328 to 842	0.27	-328 to 1184	0.45
Ohms		0 to 2000Ω	0.40Ω	0 to 2000Ω	0.40Ω
mV		-20 to 120mV	15mV	-20 to 120mV	15mV
B		1022 to 3308	1.80	392 to 3308	5.40
E		32 to 1832	0.54	-328 to 1832	1.08
J	IEC 584	-1 32 to 1472	0.54	-328 to 2192	1.26
K	(ITS-90)	-191 to 2498	1.08	-328 to 2498	1.62
N		32 to 2372	0.72	-328 to 2372	2.70
R, S		932 to 3200	1.08	-58 to 3200	1.80
T		-148 to 752	0.54	-418 to 752	0.90

## Specifications

**Accuracy:** Output D/A: ±0.025% of span; Cold Junction: ±0.9°F

**Digital Ambient Temperature Effect:** RTDs or Ohms: 0.050% of reading in Ohms. T/Cs or mV: 0.080% of reading in mV; Output D/A: (0.045% of span; Cold Junction: 40:1 rejection).

**Output:** 4-20 mA or Honeywell digital DE protocol. HART and DE available with 4 to 20 mA output.

**Adjustment Range:** No limits within max. range except minimum span limit of 1 engineering unit

**Damping Time Constant:** Adjustable, 0-102 sec. damping

**Output Response Time:** 1 sec. to reach 63% of final value with 0 sec. damping

**Output Update Time:** Approx. 0.5 sec

**Sensor Open Circuit:** User-selectable open circuit/burnout detection. Upscale or downscale with critical status message. Latching or nonlatching sensor burnout action.

**Rejection Mode:** Common: 120 dB (1 million to 1) from 50 Hz to 50 kHz. Series: 40 dB (100 to 1) for 50 or 60 Hz ±0.5 Hz (with internal software filter set to local power line frequency).

**RFI Rejection:** ±0.1% of span at 30V/m over 20 to 1,000 MHz in metallic housing and with shielded cables.

**Materials:** Terminal Block: Noryl; Module Housing: Noryl with metal interior surface; Connection Screws: Nickel-plated brass

**Approvals:** The STT250 is Intrinsically Safe to CENELEC, FM, and CSA standards when used with suitable safety barrier. The module is Zone 2 and Explosion-Proof to CENELEC, FM and CSA standards when installed in suitable housing.

**In Explosion-Proof Housing:** See model selection guide.

## Ordering Instructions

Make one selection from each table section below. A finished catalog number looks like this: STT25M - - - - - 00E - - - - - 00

## Model Selection Guide

Description		Catalog Number	Availability		Price
STT250: Smart Temperature Transmitter	No Housing, DIN-Rail or Wall Mounted		↓	↓	\$0.00
	Head Mounted to Sensor in Small Housing				0.00
	Field Mounted in Explosion-Proof Housing (CE Approved)			↓	0.00
4-20 mA Output, SCT Configurable		STT25M-	•	•	480.00
HART 5 Protocol, 4-20 mA Output		STT25H-	•	•	560.00
Hart 5 Protocol, Dual Input, 4-20 mA Output		STT25T-	•	•	690.00
HART 6 Protocol, 4-20 mA Output		STT25S-	•	•	610.00
Digital DE/4-20 mA Output for Digital Integration		STT25D-	•	•	670.00
No Integral Sensor, Probe, or Thermowell Supplied		0-	•	•	0.00
No Housing Supplied		0 _ _ -		•	0.00
Field-Mount Housing Exp-Proof Aluminum/Poly/Epoxy Paint		E _ _ -	a		67.00
Field-Mount Housing, Exp-Proof 316 SS		T _ _ -	a		384.00
Cable Entry	Not Applicable — No Housing Supplied	_ 0 _ -		•	0.00
	1/2" NPT Cable/Conduit Entry	_ N _ -	•	•	0.00
Integral Meter	None	_ _ 0 -	•	•	0.00
	Smart Digital Meter for Field Mount Housing	_ _ S -	i		248.00
Configuration	None — Factory Default Supplied	0 _ _ -	•	•	0.00
	User-Specified Configuration (Call Lesman)	T _ _ -	•	•	19.00
Customer Tagging	None	_ 0 _ -	•	•	0.00
	316 SS Wired-on I.D. Tag (4 lines, 28 char/line)	_ T _ -	d	d	19.00
Manual		_ _ E -	•	•	23.00
Mounting Hardware	None	0 _ _ -	•	•	0.00
	Carbon Steel Mounting Bracket for 2" Pipe	M _ _ -	•		29.00
	Stainless Steel Mounting Bracket for 2" Pipe	S _ _ -	•		73.00
Adapter		_ 0 _ -	•	•	0.00
Lightning Protection	None	_ _ 0 -	•	•	0.00
	Internal Surge/Lightning Protection	_ _ S -	•		107.00
Certificates		000-	•	•	0.00
SIL2	No SIL2-TUV Certification	00-	•	•	0.00
	SIL2- TUV Certification (STT25S Only)	S2-	•	•	19.00
Approval Body (FM)	Explosion-Proof (Cl. I, Div. 1, Grps A-D) Dust Ignit.-Proof (Cl. II, III, Div. 1 Grps E-G) Intrinsic Safe (Cl. I, II, III, Div. 1 Grps A-G) Non-Incendive (Cl. I, Div. 2, Grps A-D) Suitable for Cl. II, III, Div. 2, Grps F, G	1C	•		14.00
	Explosion-Proof (Cl. I, Div. 1, Grps B-D) Dust Ignit.-Proof (Cl. II, III, Div. 1 Grps E-G) Intrinsic Safe (Cl. I, II, III, Div. 1 Grps A-G) Non-Incendive (Cl. I, Div. 2, Grps A-D) Suitable for Cl. II, III, Div. 2, Grps F, G	1J	•		14.00

## Restrictions

- a 20 characters max. on nameplate, available at no cost.  
 d Model number does not appear on module or head mount housing. Order wired-on tag.  
 i Available only on STT25D and STT25M transmitters.

Looking for a HART® handheld communicator?  
 See page 136

Works with Honeywell MC Toolkit for configuration and diagnostics. See page 187.



Search [www.lesman.com](http://www.lesman.com) for

Honeywell STT350

Go

### Ordering Instructions

Make one selection from each table section at the right.  
A finished catalog number looks like this:

STT35 - - - - -

### Specifications

**Output:** 4-20 mA; *Output D/A Accuracy:*  $\pm 0.025\%$  span

**Ambient Temperature Limits:** -40° to 185°F

**Humidity Limits:** 5-100%

**Adjustment Range:** No zero/span limit within range.

**Damping Time Constant:** Adjustable from 0-102 sec. digital dampening.

**Thermocouple Burnout:** Upscale or downscale with status message.

**Hazardous Conditions:** STT3000 meets intrinsic safety requirements (and explosion-proof requirements when mounted in an explosion-proof housing) for North American Classifications: Class I, Groups B-D, Div. 1.

**Complete specs available at [Lesman.com](http://Lesman.com)**

Foundation Fieldbus version available. Prices start at \$1075.00

### Input Actuators

Input Type	Rated Range Limits	
	°C	°F
Thermocouples		
B	200 to 1820	392 to 3308
C, D	0 to 2300	32 to 4146
E	-200 to 1000	-328 to 1832
J	-200 to 1200	-328 to 2192
K	-200 to 1370	-328 to 2498
N (Nicrosil/Nisil)	-200 to 1300	-328 to 2372
R, S	-50 to 1760	-58 to 3200
T	-250 to 400	-418 to 752
NiNiMoly	0 to 1300	32 to 2372
RH Radiamatic	420 to 1800	788 to 3272
Resistance Temperature Detectors (RTDs)		
Pt100J (JIS1604-81)	-200 to 640	-328 to 1184
Pt100 (IEC 751), Pt200, Pt500	-200 to 850	-328 to 1562
Cu10, Cu25	-20 to 250	-4 to 482
Ni500	-80 to 150	-112 to 302
Linear Signals	-1000 to 1000 mV, 0 to 2000 $\Omega$	

## STT350 Smart Temperature Transmitter

### Features

- Wide variety of accepted inputs reduces transmitter inventory.
- Standard digital cold-junction compensation provides accurate and reliable temperature measurement over a wide ambient range.
- Smart features include reading of high/low inputs, external cold junction compensation temperature, and choice of engineering units displayed.
- Smart transmitter with local or remote interfacing means significant manpower efficiency in commissioning, startup, and ongoing maintenance.
- Suitable for true 2-, 3-, or 4-wire Pt100 measurement.
- Write-protect link safeguards configuration settings.
- Includes sensor break detection on all input wires.

### Model Selection Guide

Description			Catalog Number	Notes	Price
STT350 Temperature Transmitter Module (4–20 mA/DE)			STT350-	↓	\$892.00
FM	Intrinsically Safe for Class I, II, III, Div. 1, Gr A –G Non-Incendive for Class I, Div. 2, Gr A –D				
CSA	Intrinsically Safe for Class I, II, III, Div. 1, Gr A –G				
CENELEC	Intrinsically Safe for EEX ia IIC T4/T5/T6				
CE Mark	All models comply with EN 50081-2 and 50082-2				
No integral sensor probe or thermowell supplied			0-	•	0.00
Sensor probe or thermowell mounted or tested w/STT3000			1-	•	0.00
Field Mt. Housing	No explosion-proof housing supplied Explosion prf housing, baked-on polyester/Epoxy paint		00 __ EP __	• •	0.00 66.00
Integral Meter	No meter supplied Integrally housed smart meter (S900 model)		__00- __SM-	• j	0.00 245.00
Configuration	Factory default configuration Transmitter configuration		00 __ TC __	• •	0.00 18.00
Customer Tagging	None 316 SS customer tag, wired-on, 4 line, 28 char./line		__00- __TG-	• j	0.00 18.00
Mounting Assembly	None Carbon steel mounting bracket for 2" pipe Stainless steel mounting bracket for 2" pipe Two DIN-rail mounting clips (Top Hat or G-Rail)		000 ____ MBO ____ SBO ____ DRO ____	• j j k	0.00 28.00 72.00 18.00
Lightning Protection	None Internal surge/lightning		__00 __ __SP __	• j	0.00 168.00
Manual	Printed English Operation Manual		____EN-	•	47.00
Optional Certificate	No transmitter configuration/calibration certificate		00 _	•	0.00
	Transmitter configuration/calibration certificate		0D _	•	13.00
	No certificate of conformance/origin		__0-	•	0.00
Certificate of conformance/origin			__C-	•	13.00
No Additional Features			0000-	•	0.00
Approvals					
Body/Type			Location or Classification		
No certificate included (See standard approvals above.)			0000	•	0.00
FM	Explosion-prf. Dust ignition prf. Intrinsically safe Non-incendive	Class I, Div. 1, Gr. A-D Class II, III, Div. 1, Gr. E-G Class I, II, III, Div. 1, Gr. A-G Class I, Div. 2, Gr. A-D Suitable for Class II, III, Div. 2, Gr. F, G	1C	j	13.00
FM	Explosion-prf. Dust ignition prf. Intrinsically safe Non-incendive	Class I, Div. 1, Gr. B-D (with Indicator) Class II, III, Div. 1, Gr. E-G Class I, II, III, Div. 1, Gr. A-G Class I, Div. 2, Gr. A-D Suitable for Class II, III, Div. 2, Gr. F, G	1J	j	13.00
FM	Intrinsically safe Non-incendive	Class I, II, III, Div. 1, Gr. A-G Class I, Div. 2, Gr. A-D, Class II, III, Div 2, Gr F, G	1G	j	13.00

### Notes and Restrictions

j Available only with explosion-proof field-mount housing.

k Available only on integral mount models, no integral meters.

## New! SITRANS T Temperature Transmitters

Siemens' SITRANS TH compact head-mount transmitter is designed to fit in Form B connection heads, even in the flat cover version installed in place of a terminal block. Features include galvanic isolation to 500VAC, Ex approval, and ruggedness at temperatures ranging from -40° to 185°F.

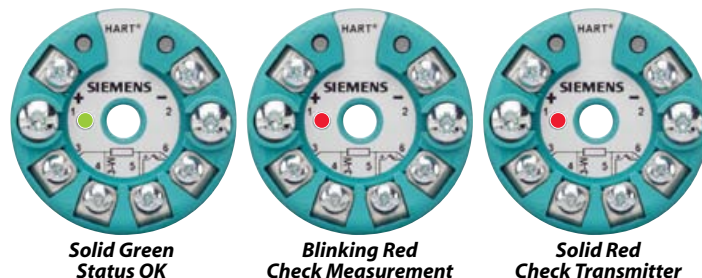
The basic TH100 is a straightforward compact transmitter for RTD inputs. With measuring technology that's universal and accurate, the PC-programmable TH200 and HART-programmable TH300 offer versatile diagnostics and simulation options in a service-friendly package.

The operating status of these units can be seen at a glance, thanks to a pair of colored LEDs. All your technician needs to do is connect an ammeter to the test sockets, and read the output current — without opening the measuring circuit.

The TH400 is designed for Profibus PA and Foundation Fieldbus installations. TH400 features include programmable sensor, limit values, failure behavior, and galvanic isolation, plus sensor redundancy, when installed with two input sensors.

TH100 and TH200 transmitters can be configured using a special modem and PC-based SIPROM T software. The HART-enabled TH300 offers user-friendly operation using Siemens SIMATIC PDM or a HART communicator. PDM is the configuration tool of choice for TH400 Profibus

### At-a-Glance Diagnostics



PA models. The TH400 Foundation Fieldbus model requires use of an FF communicator or AMS software.

SITRANS TW rail-mount transmitters are great for control room applications. They feature an auxiliary power connection for great flexibility and a relay output. TW transmitters can be configured for 4–20 mA output, 0–20 mA, and 0–10 or 2–10 VDC via HART protocol. The transmitter can be operated via SIMATIC PDM or a HART handheld communicator.

## Two-Wire Head-Mount Transmitter for RTDs



Designed for economic use, the TH100 offers low-cost plant operation and reliable measurements. It's the ideal replacement for over-aged analog Pt100 transmitters. Transmitter setup is quick and easy with SIPROM T configuration tool, which can be downloaded free from Siemens website.

- Ideal for Pt100Ω RTD measurements
- 4–20 mA linear temperature output
- Fits a Form B connection head
- Internal temperature compensation
- 8–35 VDC power supply (30V for Ex)
- Configure using modem and free SIPROM T software
- ATEX/cFmus intrinsically safe, non-incendive model available

### Model Selection Guide

Please submit orders to: Siemens Industry Inc,  
c/o Lesman Instrument Company

Description	Catalog Number	Price Each
Siemens SITRANS TH100 Temperature Transmitter for RTD Input		
Non-Explosion-Proof Enclosure	7NG3211-0NN00	\$105.00
Explosion-Proof Enclosure	7NG3211-0BN00	150.00
Modem for TH200 and SIPROM Software	7NG3190-6KB	293.00
USB Interface for TH100 and TH200	7NG3092-8KU	318.00

Free SIPROM T software download at [Siemens.com](http://Siemens.com).  
Order on CD (P/N A5E00354512) for \$8.00

## Two-Wire Head-Mount Bus Protocol Transmitters for Universal Inputs



SITRANS TH400 is available either with PROFIBUS PA or FOUNDATION Fieldbus (FF). It is designed to support all common RTD, thermocouple, resistance and millivolt sensors. Setup is quick and easy with SIMATIC PDM (PA) or AMS and handheld communicator (FF). Due to its small size, the device allows flexible mounting options, even in a DIN Type B connection head.

- Fits a Form B connection head
- Pt100Ω RTD, thermocouple, and mV inputs
- Input redundancy with second sensor input
- Single or dual point trim
- High accuracy over ambient temperature range
- Difference and average measurements
- Custom characteristics curve for using with non-standard sensors
- Alarm signal for break on short circuit
- Extensive diagnostics and simulation mode
- Programmable via SIMATIC PDM or HART® handheld communicator
- Rugged design, fully potted electronics
- Galvanic isolation for accuracy and safety in thermocouple applications
- ATEX/cFmus intrinsically safe, non-incendive models available

### Model Selection Guide

Submit orders to: Siemens Industry Inc,  
c/o Lesman Instrument Company

Description	Catalog Number	Price Each
Siemens SITRANS TH400 Profibus PA Temperature Transmitter		
Non-Explosion-Proof Enclosure	7NG3214-0NN00	\$557.00
ATEX/FM Explosion-Proof Enclosure	7NG3214-0AN00	597.00

Call for price on Foundation Fieldbus models.

Standard transmitter  
wiring diagrams  
available on page  
489.



# SIEMENS

## Two-Wire Head-Mount Transmitters for Universal Inputs



**SITRANS T  
TH200**



**SITRANS T  
TH300**

**HART**  
FIELD COMMUNICATIONS PROTOCOL

SITRANS TH200 and TH300 are designed to support all common RTDs, thermocouples, resistance and millivolt-sensors. Unique user-friendly details are implemented: Without opening the 4–20mA loop, the output current can read directly with a multimeter. A red/green LED shows the technician the status at a glance. Additional diagnostic features, like a drag indicator and time meter, plus output current to be used for simulation.

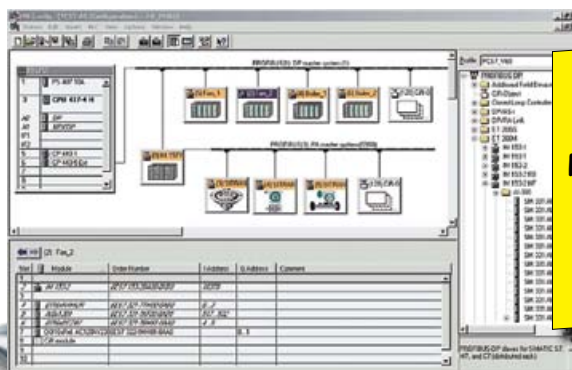
TH200 setup is quick and easy with the transmitter-modem and SIPROM T software. SITRANS TH300 can be configured with SIMATIC PDM or HART handheld programmer. (See pages 187 and 188 for configuration tools.)

- Pt100Ω RTD, thermocouple, and mV inputs
- Fits a Form B connection head
- Temperature compensation via internal reference junction
- Difference and average measurements
- Single or dual point trim
- 4-20 mA linear output signal
- Alarm signal for sensor break or short circuit according to NAMUR 43
- Galvanic isolation for accuracy and safety in thermocouple applications
- Custom characteristic curve for application of non-standard sensors
- ATEX/cFmus intrinsically safe, non-incendive models available
- 8-35 VDC power supply (30V for Ex)
- TH200 programmable using free SIPROM T software, TH300 programmable via HART® and SIMATIC PDM
- Universal input DIN-rail mount models available. Prices start at \$303.00

### Model Selection Guide

Please submit orders to: Siemens Industry Inc,  
c/o Lesman Instrument Company

Description	Catalog Number	Price Each
Siemens SITRANS TH200 Universal Input Temperature Transmitter		
Non-Explosion-Proof Enclosure	7NG3211-1NN00	\$255.00
FM-Approved Explosion-Proof Enclosure	7NG3211-1BN00	295.00
Siemens SITRANS TH300 Universal Temperature Transmitter with HART®		
Non-Explosion-Proof Enclosure	7NG3212-0NN00	368.00
FM-Approved Explosion-Proof Enclosure	7NG3212-0BN00	409.00
Modem for TH200 and SIPROM Software	7NG3190-6KB	293.00
USB Interface for TH100 and TH200	7NG3092-8KU	318.00
USB HART Modem for TH300	7MF4997-1DB	499.00



**Configure just about  
any HART®-compatible  
instrumentation with your  
PC and Siemens' SIMATIC  
PDM software tool!**  
**See pages 187-188 for  
handheld communicators  
and PDM software.**



**SITRANS  
TW**

## Four-Wire DIN-Rail Mount Transmitter for Universal Inputs

SITRANS TW is the latest in development of the proven DIN-rail mounted SITRANS T four-wire system. Its diagnostic and simulation functions provide the necessary clarity during commissioning and operation. Its HART®-interface makes the SITRANS TW easily adaptable to any measuring job with SIMATIC PDM.

Physical values can be preset with the simulation function. This enables testing of the complete signal path right as far as the control system without the need for tools. The drag pointer functions measure the system's process variable minimum and maximum. All SITRANS TW control room devices are available in non-intrinsically safe versions, or intrinsically safe versions for applications under extreme conditions.

- Transmitter in four-wire system with HART® communications interface
- Pt100Ω RTD, thermocouple, and linear inputs
- Internal temperature compensation
- 115/230 VAC or 24 VDC power supply
- Configurable via SIMATIC PDM software
- Monitors sensor and cable for open and short circuits; All circuits electrically isolated
- 4-20 mA, 0-20 mA, 0-10V, or 2-10V output
- Can be mounted on 35mm or 32mm G DIN rail
- Automatic zero and span correction
- ATEX EEx [ia] or EEx [ib] explosion protection for measurements with sensors in hazardous areas

**Prices start at \$449.00. Call for  
model selection and availability.**

# SITRANS T Temperature Transmitters

**SIEMENS**



## TF2 Field Mount Temperature Indicator with Integral RTD

### Features

- IP65 rating
- Integrated Pt100Ω RTD input
- High-grade steel
- 4-20 mA output
- Local indicating display
- Three programming keys
- 12 to 30 VDC power supply

### Model Selection Guide

Please submit orders to: Siemens Industry Inc,  
c/o Lesman Instrument Company

Description		Catalog Number	Price Each
Siemens SITRANS TF2 Field Temperature Indicator: Transmitter with LCD display, IP65 stainless steel housing, sensor Pt100Ω per DIN IEC 751, measuring range -50° to 200°C with local parameterization, 4-20 mA output.			
SITRANS TF2		7NG3140-	\$446.00
Display Position	Bottom Mounting, Type A, 1/2" NPT	3	8.00
	Back Mounting, Type B, 1/2" NPT	4	8.00
Connection	1/2" 14 NPT	B	0.00
Thermowell Length	4.5" (114 mm)	K	0.00
	7.5" (190 mm)	P	4.00
Thermowell	Stainless Steel	0	0.00



## TF Field Mount Transmitter for Harsh Environments

### Features

- Pt100Ω RTD, thermocouple, and linear (voltage) inputs
- Varnished die-cast aluminum or high-grade steel
- 4-20 mA output
- IP68 rating, ATEX EEx d approval, FM intrinsically safe and explosion-proof
- Local indicating display option; 5 digits, ±99.999
- TF with TK head-mount transmitter: 6.5 to 35 VDC power supply, programmable with SIPROM T
- TF with TK-H head-mount transmitter: 8 to 35 VDC power supply, programmable by SIMATIC PDM or HART® communications device.
- Remote sensor mount capability allows the electronics to be isolated from high process temperatures and vibration

**See page 188 for SIMATIC PDM software.**

### Specifications

**Enclosure:** NEMA 4X, Die-cast aluminum, polyester-based lacquer, stainless steel rating plate; Electrical/sensor connection: Screw terminals, cable inlet via 1/2-14 NPT threaded gland

**FM Approval:** Explosion Proof Div 1, Class 1, Groups B-D; Dust-Ignition Proof Div II, III, Class 1, Groups E-G; Non-Incendive Div 1, Class 2, Groups A-D; Intrinsically Safe Div II, III, Class 2, Groups F, G

Input	Measured Range	Minimum Span	Digital Accuracy
Resistance Temperature Detectors			
Pt25Ω to Pt500Ω	-328° to 1562°F (-200° to 850°C)	18°F (10°C)	0.18°F (0.1°C)
Pt500Ω to Pt1000Ω	-328° to 662°F (-200° to 350°C)		
Cu25Ω to Cu1000Ω	-58° to 482°F (-50° to 250°C)		
Thermocouples			
Type B	932° to 3308°F (500° to 1820°C)	90°F (50°C)	3.6°F (2°C)
Type C, Type D	32° to 4172°F (0° to 2300°C)	180°F (100°C)	3.6°F (2°C)
Type E	-418° to 1652°F (-250° to 900°C)	90°F (50°C)	1.8°F (1°C)
Type J	-346° to 2192°F (-210° to 1200°C)	90°F (50°C)	1.8°F (1°C)
Type K	-382° to 2498°F (-230° to 1370°C)	90°F (50°C)	1.8°F (1°C)
Type L	-328° to 1652°F (-200° to 900°C)	90°F (50°C)	1.8°F (1°C)
Type N	-328° to 2372°F (-200° to 1300°C)	90°F (50°C)	1.8°F (1°C)
Type R, Type S	32° to 3182°F (0° to 1750°C)	180°F (100°C)	3.6°F (2°C)
Type T	-364° to 752°F (-220° to 400°C)	72°F (40°C)	1.8°F (1°C)
Type U	-328° to 1112°F (-200° to 600°C)	90°F (50°C)	1.8°F (1°C)
mV Sensor	-10 to 70mV	2mV	40 μV
mV Sensor	-100 to 1100 mV	20 mV	400 μV
Resistance Sensor	0-390Ω	5Ω	0.05Ω
Resistance Sensor	0-2200Ω	25Ω	0.25Ω

### Model Selection Guide

Please submit orders to: Siemens Industry Inc,  
c/o Lesman Instrument Company

Description		Catalog Number	Price Each
Siemens SITRANS TF Temperature Transmitter: Two-wire system, 4-20 mA output, electrical isolation, 1/2"-14 NPT screwed gland connection, user manual			
SITRANS TF		7NG313 _	\$423.00
Integrated Transmitter	None	0-0	0.00
	None, FM/CSA Protection*	0-5	50.00
	SITRANS TH200	5-0	247.00
	SITRANS TH200, FM/CSA*	5-5	297.00
	SITRANS TH300 (HART®)	6-0	331.00
	SITRANS TH300 (HART®), FM/CSA*	6-5	381.00
Housing	Diecast Aluminum	AC	0.00
	Stainless Steel Precision Casting	EC	797.00
Indicator	None	0	0.00
	Digital Display	1	229.00
Mounting Bracket	None	0	0.00
	Carbon Steel	1	46.00
	Stainless Steel	2	73.00
SIPROM T Parameterization Software CD		A5E00354512	8.00
Modem for TH200 and SIPROM Software		7NG3190-6KB	293.00
USB HART Coupler for SIMATIC PDM/SIPROM		7MF4997-1DB	499.00
RS-232 HART Modem for SIMATIC PDM/SIPROM		7MF4997-1DA	439.00

\* FM approval includes explosion-proof, dust/ignition proof, non-incendive, and intrinsically safe ratings

# TouchTemp II Programmable Temperature Transmitter



- **Universal Temperature Transmitter**  
8 thermocouples, 6 RTD types, millivolts, and ohms.
- **Two-Button Programming**  
No jumpers, dipswitches or communicators required.
- **Integral, Full Five-Digit Display**  
Displays process inputs, engineering units, plus warning and programming prompts with 0.1° resolution.
- **Complete Diagnostics**  
Checks for reference voltage, cold junction, EEPROM and CPU errors. Also indicates under- or over-range and open input conditions.
- **0.05% Digital Accuracy. Field Tough.**  
Standard features include isolation, RFI protection and outstanding accuracy over the widest ambient range (-40° to 185°F).
- **HART® Communications Model Available**



## Specifications

**Input Span Limits:** Any span within range limits

**Input Resolution:** Temperature: 0.1°; mV: 1 µV; Ohms: 0.01Ω

**Maximum Output Range:** 3.7 to 22 mA DC

**Calibrated Output Range:** 4 to 20 mA DC

**Output Resolution:** 0.002 mA

**D/A Accuracy:** ±0.035% span (total analog accuracy is the sum of the digital accuracy and the D/A accuracy)

**RTD Excitation Current:** 200 µA typical

**Input Impedance:** T/C or mV: >10 megohms

**Common Mode Rejection:** >120 dB @ 50/60 Hz

**Normal Mode Rejection:** >60 dB @ 50/60 Hz

**Input/Output Isolation:** 500 VAC

**Operating Temperature Range/Humidity:** -40° to 185°F (-40° to 85°C); 5% to 95% RH non-condensing

**Storage Temperature Range:** -58° to 212°F (-50° to 100°C)

**Temperature Effect:** T/C: ±0.2 µV/°C ±0.005% input reading/°C ± CJC; mV: ±0.2 µV/°C ±0.005% input reading/°C; Ohms/RTD: ±0.002Ω/°C ±0.005% input reading/°C; Cold Junction Compensation: 0.005°C/°C

**Loop Supply Voltage:** 13V + (load resistance x 20 mA) min., 30V max.

**Power Supply Effects:** 0.005% span/volt

**Non-Destructive Input:** 30 volts peak

**RFI Effect:** <1% with no abnormal behavior at 10V/m @ 450 MHz

**Stability:** 0.1% or 0.1°C, whichever is greater, for six months with constant reference to conditions

**HART Protocol:** Supports HART universal commands 0, 1, 2, 3, 6, 11-19 as well as Standard Practice Commands 34, 35, 36

**Approvals:** Classified as non-incendive for Class 1, Div 2, Group A-D hazardous (classified) indoor locations

**Transmitter Housing:** Injection molded, high impact, conductive plastic; meets flammability requirements of UL94 V-O



## Input Actuators

Input Type		Conformance	Range Limits	
			°C	°F
RTD	Pt100 (DIN/IEC751)	0.15°C	-200/850	-328/1562
	Pt200 (DIN/IEC751)	0.3°C	-200/850	-328/1562
	*Pt500 (DIN/IEC751)	0.25°C	-200/260	-328/500
	Pt100 (JIS C 1604)	0.14°C	-200/650	-328/1202
	Ni110 (Bristol 7NA)	0.12°C	-105/310	-157/590
	Ni120 (Minco 7-120)	0.12°C	-80/320	-112/608
	Cu10 (Minco 16-9)	0.5°C	-200/260	-328/500
T/C	J (NIST)	0.25°C	-180/1200	-292/2192
	K (NIST)	0.5°C	-180/1372	-292/2501
	T (NIST)	0.2°C	-200/400	-328/752
	E (NIST)	0.2°C	-200/1000	-328/1832
	R (NIST)	0.6°C	0/1767	32/3212
	S (NIST)	0.5°C	0/1767	32/3212
	*B (NIST)	0.8°C	100/1820	212/3308
	N (BS4937)	0.4°C	0/1200	32/2192
Millivolts			-100 to 100mV	
Ω/RTD 2,3 or 4 wire			0 to 1000 Ω	

\*Pt500, B T/C, and DIN T/C Types available on Special Order.

## Model Selection Guide

Description		Catalog Number	Price
TouchTemp II™ Temperature Transmitter		2800T	\$395.00
TouchTemp II™ HART® Temperature Transmitter		2850T	\$25.00
Mounting Options	Surface Mounting Bracket	500148-089	20.00
	35mm DIN Rail Mounting Bracket	100665-652	20.00

**Need a special thermocouple or RTD for your process?**

*If you can draw it, design it, or describe it, we can build it!*

See the configuration form at [www.Lesman.com/datasheets](http://www.Lesman.com/datasheets)





## Temperature Sensor and Transmitter Accessories



### MFC4150 HART® Handheld Communicator

- Smaller and faster than the competitor's unit, with eight times the storage capacity
- Just 15 seconds from power-up to use!
- Powered by six AA Alkaline batteries; 28-hour battery life, up to 60 hours without backlight
- CE-approved general purpose and ATEX/UL-approved intrinsically safe models
- Document and store 200 configurations; Clone, upload, and download configurations; Offline mode for editing and reviewing configurations
- Alphanumeric keypad with menu shortcuts for frequently used commands, dedicated text edit keys, HART menu Home key and left-side thumb keys for easy one-handed navigation
- Update firmware and device files for up to 420 HART devices from Meriam's website

All communicator kits include: CE or ATEX approved HART communicator, HART lead kit, one 6-pack AA Alkaline batteries, communication/AC adapter dongle, RS-232 serial cable, universal power adapter, protective boot, soft carrying case, adjustable shoulder strap, user manual, software CD with Meriam DPC manager utility for downloading and installing firmware and device file updates. (Only -01 models include the subscription to the DOF download site at [www.meriam.com](http://www.meriam.com).)



#### Model Selection Guide

Description	Catalog Number	Price
Communicator with 3-Year Device File Download Website Subscription		
General Service HART Communicator	MFC4150-01	\$3847.00
Intrinsically Safe HART Communicator	MFC4150X-01	4046.00
Communicator, No Download Subscription		
General Service HART Communicator	MFC4150-00	3302.00
Intrinsically Safe HART Communicator	MFC4150X-00	3501.00



### Mini Power DIN Rail Mount DC Power Supply

Slim power supply for use in performance class up to 100W. The consistent provision of an input of 85–264 VAC or 90–350 VDC, an integrated power reserve, POWER BOOST, ensures safe operation in AC and DC networks.



#### Specifications

- Input voltage:** 85 –264 VAC, 90 VDC–350 VDC
- Output voltage:** 24 V (Signal); Range: 22.5–28.5 VDC (>24 V constant capacity)
- Nominal voltage:** Input: 100 –240 VAC; Output: 24 V ±1 %
- Continuous current:** Max. 20 mA
- Output current:** 1A (Up to 60°C); 1.3A (With POWER BOOST)
- Frequency range:** 45 Hz–65 Hz (0 Hz with DC input)
- Inrush surge current:** <15 A (Typical)
- Input fuse:** 1.25 A (Slow-blow, internal)
- Maximum power dissipation idling:** 1 W
- Power loss nominal load max.:** 4.5 W
- MTBF:** >500,000 hr in accordance with IEC 1709 (SN 29 500)

MiniPower provides the total output capacity for more than 20 ms in the case of a power failure. Mini Power has approvals such as UL 60 950 for IT equipment and UL 508 for industrial control equipment.

**Status display:** LED green

**Ambient temperature:** -25°–70°C (> 60°C derating)

**Enclosure:** IP20, Class 2 (in an enclosed control cabinet) *Installation:* Horizontal DIN rail

**Approval:** UL; EN 60950/VDE 0805 (SELV); DIN VDE 0100-410, DIN VDE 0106-1010; CE compliance with EMC directive 89/336/EEC; *Emitted interference:* EN 50081-2; *Immunity:* EN 61000-6-2

#### Model Selection Guide

Description	Catalog Number	Price
DIN-Rail 24 VDC Power Supply, 1A	2938840	\$108.17
DIN-Rail 24 VDC Power Supply, 1.3A	2866446	108.17
DIN-Rail 24 VDC Power Supply, 2A	2938730	141.37

### Switching DC Power Supply

- No jumpers or dip switches
- DIN rail or panel mount
- LED operation indicator
- Universal AC input (85–264 VAC)
- DC compatible input (105–370 VDC)
- UL508 listing; CE marking according to both LVD and EMC
- Unique spring-up, finger-safe terminals (ideal for ring lug terminated wire)
- Auto resetting output over current protection



#### Specifications

- Output Capacity:** 23 VDC at 300 mA; *Leakage Current:* 0.75mA max.
- Input Voltage (single-phase, 2 wire):** 100–240 VAC (85–264 VAC), 50/60Hz (47–63Hz); *Overvoltage Protection:* Output turns off at 105% (typical)
- Internal Fuse Rating:** 2A
- Overload Protection:** 120% typical (Zener-limiting)
- Operating Conditions:** 14° to 140°F (-10° to 60°C); 20 to 90% rH

#### Model Selection Guide

Description	Catalog Number	Price
24 VDC Power Supply, 7.5W, 300mA Output	PS5R-A24	\$60.00
24 VDC Power Supply, 15W, 600mA Output	PS5R-B24	86.55
12" Length DIN Rail	BNDN-12	3.95
DIN Rail Clip	BNL5	2.00

**More power supplies on 356–357. More programming devices on pages 187–188.**